



FRIDAY, MARCH 20.

Lathe for Turning Steel-Tired Wheels.

We illustrate herewith a new double-head wheel lathe, built by the Niles Tool Works, of Hamilton, Ohio, designed more especially for turning steel-tired car wheels.

The extended use of steel-tired wheels under passenger cars, engine trucks, and tenders, necessitates special appliances for turning them up. It may be done in a driving-wheel lathe, but such a machine is not well adapted to the work, and in many shops it cannot be spared for other than its legitimate work. When used for the purpose it is found too slow in its operation to do the work economically. The smaller size of the wheels and the presence of outside journals demand some modification of the ordinary driving-wheel lathe, and as such a machine has long been regarded as an essential part of the equipment of a European railroad repair shop, it is not surprising that the advent of steel-tired wheels in this country is appropriately accompanied by machines for repairing them.

The special features in the construction of this lathe are the arrangement of the heads and face-plates in such a manner that the wheels are brought up close to the latter, and the provision for turning wheels with the axles carried on their journals. By bringing the wheels and face-plates close together, short and stiff drivers may be used, and means may be employed for securely connecting them so as to drive with great steadiness. Carrying the axles on their journals enables the machine to take very heavy cuts without flinching. It is designed, by this means, to carry out the principle adopted for roll turning, broad tools being used. Wheels carried on centres could not stand the enormous thrust of such a cut. To

course to be followed in treating every one of the details of business and practice in the daily, monthly and yearly routine of the road.

As a necessary preliminary to the actual compilation and codification of the rules and regulations for the Manual a comprehensive chart should be prepared, on which the province and jurisdiction of each "department" of the road, as it now exists, should be as exactly and clearly laid down as is possible in view of certain not well-defined boundary lines; and an equally comprehensive plan should be blocked out and clearly depicted, showing the form, extent and relation to the others, of each department, as contemplated by the revised code.

We shall be met, first, by questions as to where the boundary-lines between certain of our departments should, legitimately, be drawn.

After these questions shall have been discussed and settled, and the general policy of the code determined, the establishment of a system of practice and of intercourse and interchange of business will be a process demanding for its proper conduct both care and time, but one presenting no serious difficulties nor intricate problems to be overcome, or solved.

In my opinion a system should require, among other things: 1st. Exact and complete general inventories, to be made according to a well-defined plan, at least twice a year, and at any time when ordered by the management; and special inventories to be made on occasion.

2d. The employment of a general "Property Clerk," who should receive, analyze, appraise and schedule all inventories and keep alphabetical (and otherwise systematically arranged) lists of current purchases, and issues of supplies and property of whatsoever kind, to whomsoever made. He should act, also, as general statistician and adjuster of performance-standards; and as general storekeeper, having custody of any supplies of which for convenience' sake small stocks are kept on hand.

3d. The establishment of the officer purchasing supplies for the road in the position of an agent who shall, in accordance

with, in 1873, was charged to "Repairs Cars," the report continues:]

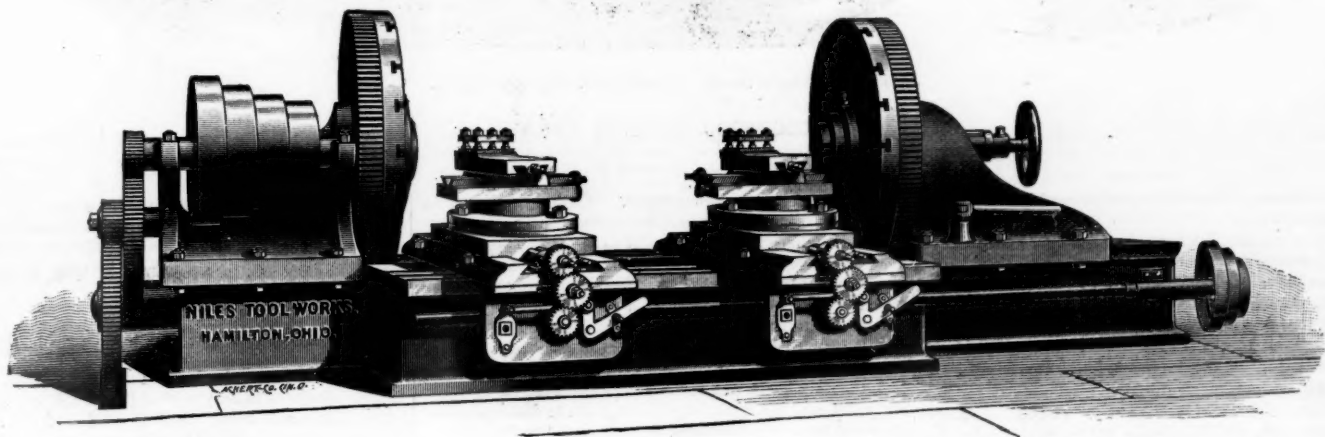
I present the foregoing analysis of this charge because it affords perhaps as striking an illustration as would be derived from an examination of any similar matter, of the manner in which an account (in this case: "Repairs Cars") is made to carry a burden the weight of which distorts and disguises it and to use still another figure of speech, *disheartens* it.

As heretofore noted, it may be, and indeed has been, and now is, claimed by persons taking a certain view of the matter, that *results* are not affected by any such influences as the mere nomenclature of accounts; that if it be understood that "links and pins" are to go into "Repairs Cars" account, it is just as well to put them there as anywhere else.

That is one view of the case. We might, under that view, put the expenditure under the head of "Contingencies"; indeed, I think it would be more consistent, everything considered, to do so, than to charge it to "Repairs Cars"; because, it seems to me, links and pins have in no wise anything to do with repairs of cars. But we dislike to show a large amount charged to "Contingencies," because, in the estimation of an interested scrutinizer of our accounts, this designation is not explicit enough; it explains nothing. A "contingent" expense is one not foreseen. The placing of an expenditure under the head of Contingencies is simply an assertion that it was casual and did not properly belong to any established account; and, further, that, inasmuch as the like may never occur again, we have seen no necessity for providing a special caption for it; and, further, still, that we have not chosen to distribute it, *pro rata*, over all accounts.

I most earnestly desire, in the interest of railway science, to see established, in regard to all accounts, a sentiment like that we have in regard to the account entitled "Contingencies," a sentiment that impels us to exclude from the account everything that may properly be shown elsewhere, and that will, I hope, grow into a determination to show everything where it properly belongs.

In order to make possible the establishment of a standard



DOUBLE WHEEL LATHE FOR TURNING STEEL-TIRED WHEELS—NILES TOOL WORKS.

do this work a machine of great strength and power is required, and the machine illustrated seems to fill these requirements.

Each head is provided with a central sliding steel spindle with centres. When carrying the axles on their journals these centres are capped, and act as thrust-bearings to prevent end motion of the axle.

When required, they are used as centres, and wheels may be turned as in an ordinary lathe. This provision permits the turning of truck wheels with journals between the wheels.

The right-hand head is movable by a quick hand motion through a rack and pinion. The carriages have compound rests, with power feed for both the upper and lower slides, so arranged that they can be instantly reversed. The feeds are driven positively by slip gears. The driving cone has four steps for a 5-in. belt, giving a sufficient variation of speed for all sizes of car wheels. The gearing throughout is accurately cut from the solid.

A number of these lathes are already in use, and we understand that they are capable of turning up from four to six pair of 42-in. wheels in a day of ten hours.

Suggestions as to Some Divisions of Railroad Accounts.

[The following are some excerpts from a report made in 1874 to the Auditor of a leading railroad company by John M. Goodwin, C. E.]

I see no necessity for going into any discussion as to whether or not a persistent critical scrutiny and comparison of accounts, and a rigid discrimination in "distribution of expenditure" are really essential to a proper and effective administration of affairs.

I take it for granted that when you set up an account, as, for instance, "Repairs, Cars," you do so after due consideration of the premises, and because of a conviction that the account is necessary; that you intend to give those of your officers and men who have to do with details of business affecting the account definite instructions as the items of expense properly chargeable thereto; and that you wish to have those items, and *only* those items, charged to the account.

In accordance with this view of the matter I have recommended the preparation of a Manual of Practice, and have specified that the manual should prescribe and describe the

with a plan for his guidance to be set forth in the Manual, fill all requisitions properly drawn (and duly indorsed by the head of the department in which they originate and by the general officer whose duty will require him to scrutinize, and with aid of information furnished by the Property Clerk, to *criticise* such requisitions), and procure delivery, to the proper parties, of the goods purchased, who shall keep complete book accounts with all persons and departments for and of whom, or which, he purchases goods, or with whom he has business transactions (including the Freight Department as handling company's freight), and render monthly statements to the Auditor and to the Property Clerk showing the entire current business of his office, and monthly statements to each head of department of the road with whom he has dealings; who shall, as per manual, act, as agent for the sale of old materials as for the several departments of the line, and make due accounts of such sales, as of other transactions; who shall make all vouchers for payments on account of purchases, and for collections for sales made by him, which vouchers shall before payment, or collection as the case may be, receive the *visé* of the head of the department receiving the goods or shipping the old material for sale, and the *visé* of the Property Clerk, and which vouchers for payment shall indicate no "distribution of expenditure," except as they show to what department the goods have been delivered, and which vouchers for collections shall be placed to the credit of the department from which the articles sold shall have come.

4th. The establishment of each department in the organization of the road (as far as concerns its operations or work, ings as receiver, custodian, dispenser and consumer of supplies, tools, machinery, and materials; as employer of labor and manufacturer of stock, and as performer of service producing revenue to the company) on an independent business footing, keeping its own accounts with the Auditor, Purchasing Agent, and Property Clerk, respectively, and with coordinate departments of the service of the line.

5th. The establishment and enforcement of a rigid accountability for property held for use or for issue; a system of graduated compensation and rewards for faithful and efficient service; and a well considered and reasonable, but always inflexible, discipline.

[After showing that about \$50,000, expended for links and

for the government of outlay in this direction [of links and pins] and to encourage an economical administration in the department having charge of the repairs of cars, let us set up a separate and distinct account for "Links and Pins."

[Speaking of securing a proper distribution of expenditure on the part of shops:]

"Of course, no shop *assumes* any expenditure belonging to another; the tendency is in the opposite direction. In the absence of any definite instructions that would govern the shops in these matters, they exercise a large discretion, and each—having in view certain 'monthly averages'—uses that discretion to relieve itself monthly of a considerable part of its pay-roll expense by charges to accounts that are not taken into calculation in figuring those 'averages.' * * *

In some cases when, in its estimation, a charge for labor and material made against it by another shop should have been made against some other department, a shop will relieve itself of the effect of what it considers an error by, in its turn, charging the same labor and material against the department by which (as it thinks) the expense should be borne. As, for instance, the Car Department charges the Locomotive Department with labor and material expended in repairing a turn-table, and the Locomotive Department transfers the expense to the Road Department, or Chief Engineer's account, by making a bill just as it would have done had the work and material been expended by itself. [Of course here are two bills for the same labor and material.]

The great fabric of railway administration resembles in some regards an immense pile of buildings that has grown from a simple beginning, story upon story, and wing after wing added to meet growing necessities, until exterior outlines are quite irregular and interior passages for intercommunication are somewhat intricate. There are consequently many incongruities noticeable in the make-up of the grand structure, and in the details of its economy. One of the most striking of these is not peculiar to railway systems; but we are discussing railway affairs now, and will speak of it as it affects railways. I mean the incongruity seen in the practice that is so excessively mindful of the actual dollar, which is only a representative of wealth, and so excessively careless in the expenditure of labor, that is the creator of wealth, and of material, that is wealth.

We should have the standard of performance based on

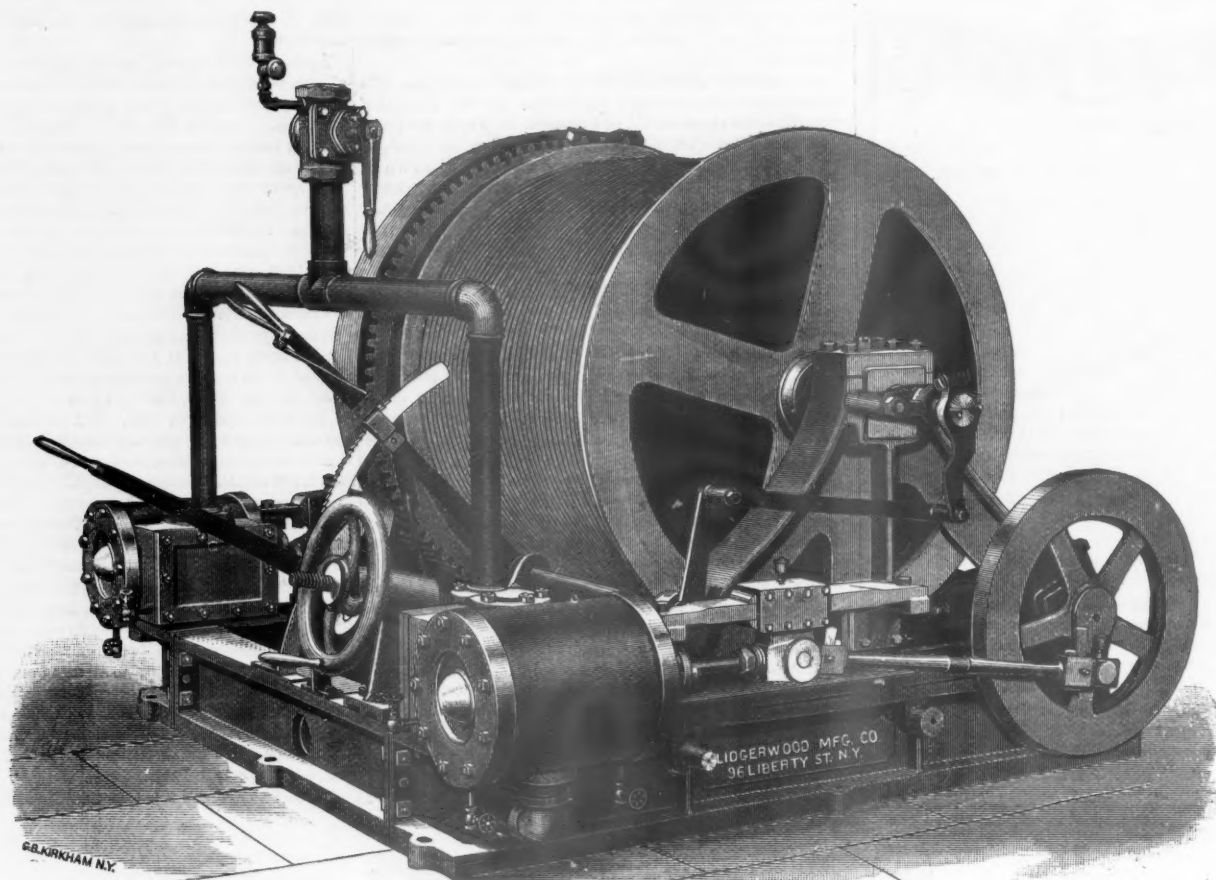


Fig. 1.—Single Drum Friction-Clutch Hoisting Engine.

LIDGERWOOD HOISTING ENGINE.

actual tests, showing what the expenditure of labor and material should effect.

In regard to the establishment of an accurate knowledge of just what "wealth" we possess, our *inventories* should give us this knowledge. For obvious reasons [stated at length in the report], we should have that knowledge, and I urge, strenuously, the necessity for *complete, correct and systematically made inventories*. [Scheme for making inventory, blanks, circular of instructions to employes, etc., given.]

You will notice that [in the blanks] I do not call for any *valuation* of the articles to be scheduled. The official valuer, the Property Clerk, would appraise the property, using for his guide his carefully prepared and constantly revised lists in his office for all ordinary articles of merchandise. Appraisements of tools, machinery, engines, cars and property of several other classes would be made by a board, of which the General Master Mechanic, the General Master Car-Builder, the Chief Engineer and the General Superintendent would, as occasion demanded, be members; and the General Property Clerk would, *ex officio*, be a member of this board. The board would arrive at its conclusions through consideration of ascertained *facts* concerning the kind, quality and condition of the things to be appraised.

The Lidgerwood Hoisting Engines.

This company has made a specialty of steam hoisting plant, which it makes in various sizes and for a variety of uses after standard patterns. The work is made to gauges and templates, and the workmanship and finish are excellent and indicate a great advance on the hoisting engine of a few years ago.

The works of this company are situated in Brooklyn, and are of modern design, the main machine and erecting shop being in three bays, the central bay being of large span and considerable height, with an overhead traveling crane capable of lifting the heavy work in and out of the heavier tools. The side spans are in two stories and contain the lighter tools.

Several overhead traveling cranes are in use throughout the shops. Two are driven by power, and in the others the hoisting is done by Box's pulley blocks. The traveling and traversing is performed by simply pushing or pulling the suspended load by hand, the crane bridge and crab running on friction rollers and being, therefore, easily moved.

The boiler shop is fitted up with Tweddel's hydraulic riveting plant, and with a very fine plate-edge planing machine by Messrs. W. B. Bement & Co., of Philadelphia. The plate-bending rolls are noteworthy. They are vertical instead of horizontal, as usual, and thus occupy less floor space, while the third roll is got out of the way when required in a very neat and convenient method. It is counterweighted, and is simply hoisted up vertically by simple gearing. The rolls are calculated to deal with plates 10 ft. wide and 1 in. thick. These rolls were made by the Lidgerwood Manufacturing Co., and are the first of their kind. The roof above the riveting machine rises to a great height, some 60 ft., the space

being spanned by a traveling crane. The longest beams for derricks, etc., can thus be machine riveted.

It is sometimes found convenient to have the holes in some of the work punched by the hydraulic riveter. As the pressure required to close a rivet is somewhat in excess of that required to punch a hole through a plate of ordinary thickness, this duty is well within the power of the machine. The aim of securing excellent boiler work has been fully secured; the edges of the plates all planed, lightly calked with a blunt tool, the rivet heads well formed and all of a size in even line and pitch, and untouched by calking, put to shame much of the work seen on locomotives.

The standard pattern of hoisting engine, with friction clutch, as shown in fig. 1, is fitted with two steam cylinders, one at each side of the hoisting-drum and link motion. The single slide-bar is of cast iron, and the cross-head has brass gibs, the bearing surfaces being very large. The bed-plate is in four main parts, and when taken apart each part occupies but a small space for shipment. Standards shaped like the letter A are bolted to the bed-plate and carry the shaft of the hoisting drum. The engines drive a shaft carrying a pinion, which gears into a spur wheel. Blocks of hard wood bolted to the back of the spur wheel form the male part of a coned friction clutch, which engages with a corresponding female taper cone on the cast-iron hoisting drum.

The spur wheel and male portion of the friction clutch revolve with the shaft, but are free to slide along it, the connection being made by means of a cross-key sliding in a slot passing completely through the shaft. A longitudinal hole is drilled from one end of the shaft to the slot, and in this works a rod attached to the cross-key. By means of a handle and screw on the end of this rod, the man in charge can slide the spur wheel and clutch along the shaft so as to engage with the hoisting drum, which, of course, runs loose on the shaft. The end-thrust is taken by a thrust-bearing of marine pattern, shallow collars turned on the shaft, and has in addition, a screwed collar on the end of the shaft. This mode of driving by friction is very convenient, avoiding jerks and snatches on the hoisting rope, while the wood blocks, when worn out, can be easily renewed by any one who can handle an ax.

Another pattern of hoisting engine driven by gearing without any friction clutch is shown in fig. 2. In this a simple and powerful brake is applied to the crank disk. The construction of this brake is clearly shown in our engraving, and needs no further explanation.

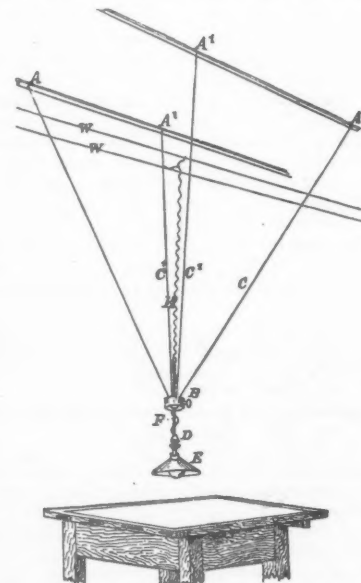
A large dredge or excavator of unusual pattern has just been completed for the Osgood Dredge Co., of Albany, N. Y. A boiler-hoisting engine and large derrick are mounted on a large car running on a track of 8 ft. gauge. So far, the size alone is unusual, the construction of parts being familiar to all who are acquainted with the well-known Osgood Dredge.

The peculiarity lies in the fact that under the centre of the car is a four-wheel truck carrying a turn-table on which the car rests. When the dipper has completed its cut, and it is desired to change the car end for end, the car is run on skids placed on the rails between the forward pair of wheels and the central truck. These skids are sufficiently thick to raise

the flanges of the end wheels of the car completely clear of the rails, so that the whole car can swing on the turn-table, and start again on a fresh cut. This operation is, of course, not often necessary, but in some kinds of work is very convenient.

The Electric Light for the Drafting Table.

One of the conveniences of the electric light is that it readily admits of being placed so that the light, as it were, burns downward, being supplied entirely from above. A much larger proportion of the total light generated can thus be utilized wherever it is desirable to throw it downward, as upon a table. For drafting tables the electric light has the further advantage that it throws out almost no heat, and has no flickering flame to be disturbed by quick motions, nor much weight to impede it. For these reasons it will be



Arrangement of Adjustable Electric Light for the Drafting Table.

especially likely to be introduced into drafting rooms where facilities for using it exist.

The engraving herewith, which we borrow from a communication to *Engineering*, shows a device for further increasing, or rather more fully utilizing, the advantages named, by an ingenious yet simple device for instantly placing the lamp, by a quick motion of the hand, in any position desired to get the proper light and to avoid casting the shadows from the edges of scales or T-squares, which all

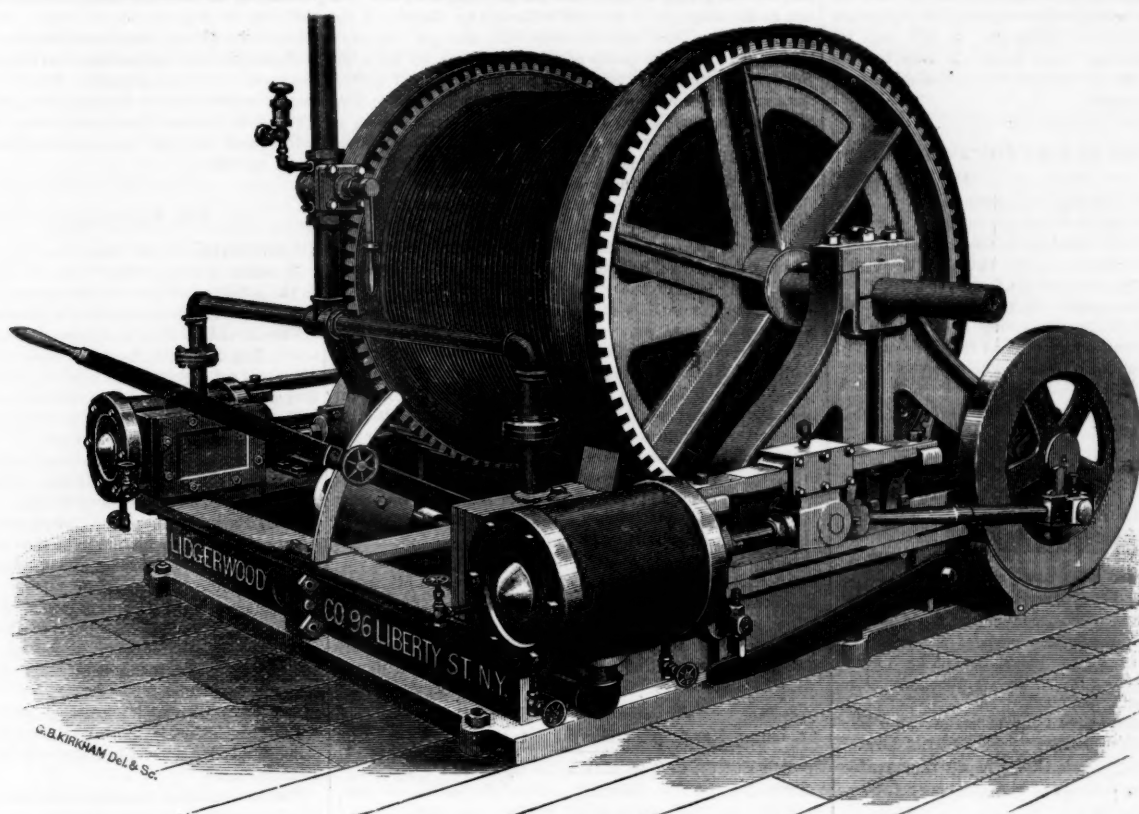


Fig. 2.—Geared Hoisting Engine.

LIDGERWOOD HOISTING ENGINES.

draftsmen know to be so annoying and to so greatly impede work by lamp-light.

The lamp is carried at the foot of a rod *F* which depends from a small wooden block *B*, is hung by two cords *c c*, *c' c'*, from four points in the ceiling. Each of the two cords passes down and up through two vertical holes in the block, crossing each other on its lower face. This permits the block to be moved easily to any part of a surface as extensive as the spread of the points of support in the ceiling, the cords slipping through the block as it is moved, while their friction serves to keep it from returning of itself after being displaced.

The lamp can be raised or lowered by sliding the rod *F* up or down in the block *B*, in which it is secured by a set-screw. A small weight at *D* keeps the rod vertical. The current reaches the lamp through a double flexible conductor *H* from a pair of main leads *W W*, which are thick bare copper wires tightly stretched across the room from wall to wall above a row of drawing tables, at a height which keeps them clear of the suspension rods when a lamp is displaced. Each man thus has his own table and lamp, and is independent of his neighbors.

Revisions in Rules for Interchange of Cars.

The last monthly meeting of the New England Railroad Club, held Feb. 25, was devoted to the discussion of this subject, President F. D. Adams in the chair and 55 members present.

The President opened the meeting and pointed out the importance of exactness in the rules and of exact adherence thereto.

On motion of Mr. John Kent, a committee of three railroad men was first chosen (Messrs. Geo. Richards, O. Stewart and John Coghlan) to nominate officers of the Club for the ensuing year.

Mr. J. N. Lauder advocated amending Rule 3 *e*, to read that wheels chipped on tread leaving a tread of 3 in. (instead of 3½ in.) should be accepted, claiming that since compromise wheels were no longer used so wide a tread was not essential to safety.

Messrs. John Coghlan and J. W. Warden questioned the expediency of the change, chiefly on the ground of the 4 ft. 9 in. gauge of the Pennsylvania system. Mr. George Richards asked in reference to the limit gauge between wheels, whether it was to be applied at top or bottom. He had known the gauge to be ⅝ to ⅞ in. wider at the top owing to the spring of the axle.

After considerable discussion of the discrepancies which existed in the practice of various roads in respect to stringency of enforcing the rules, and especially in respect to what constituted defective brakes and draw-bars, Mr. Adams urged that the only wise way was for all roads to adhere to the rules strictly. Representatives of some of the shorter roads urged that this was often more difficult and inexpedient for them than for roads having a longer haul, but it was finally voted to recommend to the next Master Car-Builders' Convention that the opening clause of Rule 3 be amended to read "Cars shall (instead of may) be refused for any of the following causes."

A suggestion by Mr. J. N. Lauder that a consolidation of Rules 5, 6 and 7 (as to carding defective cars) into one be recommended, was also adopted.

Mr. Lauder also called attention to the defect in Rule 14 (on splicing sills), which provides that the splice shall be made in the weakest point possible ("between bolster and end-sill only") where the whole strength of the timber is needed. It seemed to him that rather than to confine the splice to the weakest point it would be better to provide that it could be made at any point in the whole length of the sill.

Mr. Adams agreed with Mr. Lauder that the point where a splice was permitted was the weakest in the whole length of the sill.

Mr. Marden moved that it is the sense of this Club that the

splice shall be made at any point in the whole length of the intermediate or outside sills except over the bolster where it is now specially provided it shall be made. Agreed to.

Mr. Marden said that the enforcement of Rule 20 (as to cars destroyed on private tracks), where roads refused to be bound by it, was a legal question which would have to be settled in the courts.

Mr. Adams thought the right to appeal to law was waived by acceding to the rules. It is not within the letter or intent of the rules of interchange that a company should withdraw from a single rule unless they withdraw from the whole.

Mr. Marden agreed fully with Rule 20, and his superior officers instructed him to advocate its adoption and still adhere to it.

Mr. Adams, in answer to a question, thought that insurance policies covered cars burned on private tracks.

Mr. Marden asked how many cracked brackets would be necessary to reject a wheel.

A member answered that two or three would not cause him to reject one.

Mr. Marden would receive them if they were in different parts of the wheel.

Adjourned to Wednesday, March 25, 1885.

Contributions.

From the Late George Whitney—The Wheel-Maker's and the Railroad's Responsibility for Broken Car Wheels.

[The following letter which was found among the papers of the late George Whitney, after his death, will be read with much sadness and many tender recollections by his old friends and acquaintances. Its straightforward, manly tone can hardly increase the respect with which his friends and associates will always remember him, and the fact that it is his last communication will be the cause of profound sorrow to those who knew him.]

PHILADELPHIA, Jan. 5, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Referring to the report in your paper of 26th ult. of the discussion on the subject of "Car Wheels and Axles" at the meeting of the New York Car-Builders' Club, Dec. 18, I see that Mr. Garey said, "Records on some roads showed that 90 per cent. of the wheels removed had cracked plates," etc., and that Mr. Forney said, "Anything is likely to break," etc.

I am very greatly encouraged by the discussion, for I think the time is near at hand when there should be an agreement as to the point which separates the responsibility of the wheel-maker and that of the railroad company—in other words, an agreement as to the guarantee which should be given by the wheel-maker. Let us look at the equities of the case. At present, as claimed by the railroad companies, the wheel-maker is expected to guarantee about everything, and under all the varying conditions of wheel service in vogue under the present system in this country.

The recent freight car has a capacity of from 40,000 to 60,000 lbs., and it is frequently loaded to 70,000 lbs. or more. Trains on heavy grade roads are say 60 to 70 cars, and they are run at a minimum speed of about 18 miles per hour, and frequently "to make up time," at 30 miles or more. There are say five or six brakemen on each train, who, with hand brakes, have to control the train on descending grades by braking very severely on say 10 or 12 of the cars only, and the result is that certain wheels on every train are so suddenly heated by the brake action that the tread or rim is expanded, and, obeying the law in such cases made and

provided for metals, the brackets or the plate (which have not had time to expand also) are cracked. If the wheels so used are not sufficiently expanded to cause a fracture in the brackets or plate, the chilled portion of the tread, by repeated expansions and contractions, is disintegrated, soon causing the removal as a "shelled out" wheel.

As I firmly believe that every good and properly chilled wheel made is subject to failure from "cracked brackets," "cracked plate" or "shelled out," under the treatment received as stated, I ask whether the wheel-maker ought to be held responsible for the result of a service in which no wheel, cast, chilled or steel, has been found to be durable?

Some of the "great companies" have for some years made their own wheels; they have had access to what are supposed to be the best wheel irons in the country, and have claimed to make the best wheels possible in the present "state of the art;" and yet their records show that their own wheels are as vulnerable to failure from "cracked brackets," "cracked plate," "shelled out," etc., as those made by the reputable wheel-makers. As the "great companies" are, therefore, unable yet to make wheels which will stand the service demanded, it does not seem just and right that the wheel-maker should be required to guarantee against what he is not and cannot be responsible for. Wheels fail from a great many causes. The wheel-maker should guarantee "against defects" of manufacture, but he ought not to be asked to guarantee against failures which are due to defective use. It is very easy to ascertain if wheels are defective or not. If defective, a "worn flat" will show deficient chill, a "broken flange" a flaw, a "hollow rim" or a "split hub" a blow or air-hole, on fracturing the part; or if a wheel is cracked in brackets or plate in consequence of the metal being too hard or high in temper and not gray and tough, such defect becomes apparent on breaking the wheel.

I do not think it is possible to make a uniform kind of guarantee for 33-in. freight-car wheels, as the mileage of wheels under some kinds of cars will be obviously greater on level or low-grade roads than on those of high-grades, crossing the mountains between the coasts and the interior of the country.

I believe, however, that while each wheel-maker can best judge what mileage it will be safe for him to guarantee for the territory supplied, he should be willing to replace defective wheels, having proper credit for the mileage made by some. He should not be required to replace failures from causes due entirely to the severity of the service until such failures exceed the percentage found to be unavoidable in the wheels made by the railroad companies, which percentage can, I believe, be easily ascertained from existing records.

The railroad companies ought certainly to take some of the risk on wheels purchased, the same as they do from collisions, broken rails, frogs, axles, etc.

I believe that the cast chilled wheels made now throughout the country, with the progress made in manipulating iron from the chemical knowledge acquired, are better than have ever been made, but the service now required of them has so increased in severity that the limits of resistance have been passed, and that more good wheels are being destroyed than are fairly worn out, and a reform in this matter must soon be commenced, as the necessity of economical management of our railroads becomes more apparent.

The wheel-makers have not yet had, so far as I know, any

conference about guarantee of wheels, but if the railroad companies continue to insist that the wheel-maker is responsible for all wheels removed for failure, etc., it will soon become necessary for them to "pool issues," if they are not ready to "step down and out" and let the "coming" wheel-makers carry on the contest.

First Invention of Angle Fish-plates.

CINCINNATI, O., March 16, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I see in your paper of March 13 an article on "Angle Fish-plates," in which the writer claims to be the original inventor of it. You will see by referring to the Patent Office reports that a patent, No. 93,393, was granted to me Aug. 10, 1869. I rolled angle fish-plates under my patent in the Marietta Rolling Mill, Marietta, O., in the spring of 1870 for the Baltimore & Ohio Railroad Company, and they were applied by the then Road-master, McWilliams, which he will attest.

THOMAS J. ADAMS,
Agent Springfield Iron Co.

Accidental Breakage of Angle Bars.

PITTSBURGH, Pa., March 9, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A few days ago, in conversation with an old Baltimore & Ohio Railroad track foreman, he informed me that on the occasion of putting on a new angle-bar, owing to some defect of one of the rails, one end of the angle-bar would not enter against the web of the rail, while the other end fitted snugly. Picking up a spiking hammer for the purpose of forcing the angle-bar into position, he struck the same one hard blow, when, lo and behold! the bar broke, the fracture being similar to that of bars broken in the track.

This incident may perhaps give a clue as to the reason why so many angle-bars break in service.

EMILE LOW.

[We find on inquiry that there is no discernible cause whatever in the process of manufacture for angle fish-plates breaking as they do, near the middle on the upper edge, so that it is more probable that the above was a mere chance coincidence, due to cold-shortness or other defect in the iron, which is not unfrequently, we apprehend, of quite inferior quality.—EDITOR RAILROAD GAZETTE.]

Anti-friction Journal Bearings.

PHILADELPHIA, March 16, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have noticed an invitation to railroad officials and others from the committee appointed by the last Master Mechanics' Convention, to give their experience and all information they possess, in reference to the best metal for locomotive and other bearings. The subject is one of great importance to all railroad managers, and one which will have numerous replies from practical men and others.

I consider the question to be: What are the anti-frictional metals, and those that can be used in a composition or an alloy?

Copper and tin have been used in certain proportions and answered all purposes in the past, when high speed was not desired; but the wants of to-day are very different from the requirements of 20 or 30 years ago.

To-day we often run our rolling stock at the rate of a mile a minute, with much increased loads, and we must have an anti-frictional alloy if it can be produced. In our car brasses we are using, to a great extent, a lining or filling of lead and antimony, and with this we obtain fair service, lead being the anti-frictional component and antimony the hardener.

This is all very good so long as there is no cause for the lining to become heated.

If it does, then we drop our load on the composition backing, which, if it becomes hotter, crumbles, breaks and welds to the axle. Now the question arises, Can there be a composition made of copper, tin and lead, or copper and lead, with sufficient strength to stand the hard usage, and sufficient lead to make the composition for a bearing thoroughly anti-frictional? I not only know it can be done, but have recently been shown the process, where an indefinite quantity of lead has been amalgamated, and thoroughly mixed, and fixed with copper. I am very positive that lead is the one metal that will take the foremost rank as an anti-frictional journal metal, when alloyed with copper, and I would respectfully ask all to bear this in mind when they are wrestling with this particular subject. If it can be done every time, as I have seen it done, and of this I have been assured by the parties in possession of that process, then this is the future bearing metal that is not only a requirement but a necessity.

M. M.

Saving Oil and Tallow.

WEST PHILADELPHIA, Feb. 25, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In reading over the *Gazette* of Feb. 20, I came across an article entitled "Economy in the Use of Oil and Tallow," signed "W. P. Div." I find from personal supervision of locomotive engineers that they do not oil their engines alike for various reasons; some from carelessness, others from thoughtlessness, and a very few from reasons of economy.

You will find that a careful engineer, in oiling his engine or before putting any oil on, first sees that his oil holes are clear, so that what oil he puts on will go to the spot intended, and not run off on the ground; then he will oil all around on the outside, after which he oils underneath, not counting the drops to see that he only gets a certain quantity on each journal, bearing, or pin, as the case

may be, but giving to each what in his judgment will take him to the other end of the road without any danger of the parts heating. Now, take this same man and put him on an allowance of so many quarts to the round trip; he has a fast run and loses time on account of a journal heating or a truck box running warm, say, for two or three trips. That man would not use as much oil if he was on an allowance as he would if his supply were not limited, for the simple reason that when the list of men having saved oil for the month past is posted in the round-house, this man knows that he will find his name among those being in excess, and would rather lose a little time on the run than to be in excess on the premium sheet; and when called to the office to give cause for time lost on the run, he would be much more apt to say, "Something got into the cup and stopped the feed," than to say, "I tried to use only my regular allowance."

I understand that some years ago, when the Pennsylvania Railroad undertook to make it an object to the engineers of the New York Division to save oil and tallow, and arranged to pay so much premium per quart saved over the regular allowance, a very marked decrease in the consumption of same was noticed immediately—also a corresponding increase in the number of hot pins on engines and journals of cars, and it was discovered that some of the men, to save oil, had been stealing the waste out of freight car boxes and squeezing the oil out of it into their cans, while some of the others never oiled their engines until something heated, saying: "Oh, when she needs it, she'll smell!" which, although most certainly true, still was a very poor way to save; and the company consequently did away with their premium for oil and tallow saved.

I think these reasons, not to go deeper into the subject, are sufficient for not putting a premium of any kind on oil and tallow or waste saved.

T. A. LOW.

Mr. Isham Randolph's Simple Interlocking Apparatus.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Three cheers for Mr. Isham Randolph! He has taken a step, or at least has made public a step he has taken, which ought to be the forerunner of a thousand similar ones all over the country, looking to the better security of trains and convenience of operating them. That little note of yours in the issue of Feb. 13 is, or ought to be, one of the most important items you have published for a long time. The idea that we cannot improve our safety appliances until our wealth is adequate to the adoption of Saxby & Farmer's and Westinghouse's elaborate apparatuses has taken altogether too strong a hold upon the more intelligent and wide-awake of our managers, and, as a consequence, has had an undue influence over the thousands of others who take the aforesaid wide-awake ones for their patterns of conduct.

What could be more simple than the idea that trains should be warned at a distance of wrong switches and other obstructions? And what more crude or bungling than the methods taken to carry it out? First we have the plain target, varying in size and shape from a diamond breastpin to a mammoth sheet-iron representation of a huge uncooked griddle-cake. This ancient device is discolored by grease and smoke, nullified by having its red side covered with sleet or ice, and almost always is comparatively useless by reason of its unfavorable background. Next is the "pole and ball" signal, which, if it were more quickly manipulated, and were always a positive instead of a negative signal, and could be seen through fog and clouds of steam as well as in a clear atmosphere, and—various other things, would be a tolerably good safeguard. It is passing strange that intelligent men, having virtually all the knowledge of the world (on the subject) at their command, will continue to spend thought and money on an apparatus that is almost wholly worthless in time of fog, when it is most needed, and which for a portion or the whole of the time labors under the unscientific principle that the trainman has to look for its absence instead of its presence.

It is needless to enumerate further; the two instances named are sufficiently conspicuous monuments of the anomalous state of the American railroad mind of the present day, which seems to be so alert and enterprising in some directions and so completely the opposite in others. There is an immense amount of virtue in a simple piece of wire rope, and it is to be hoped that the example of Mr. Randolph, and others like him, will be the incentive that shall bring some of it to bear to demolish the aforesaid monuments.

I will not waste your space enumerating the great variety of circumstances under which a simple distant signal can be adapted and made useful, for every one interested certainly must be well informed on this point, and need no more than a reminder; but I think it important to remember that there are numerous degrees of simplicity and cheapness in these devices, and that it is by no means certain that we are barred out from the benefits contemplated, even where we are too poor to afford so much as the simple appliances used by Mr. Randolph. A distant signal, if not interlocked with anything, is well worth having, and if it is judicious to equip twenty stations with Mr. Randolph's device instead of spending the same amount of money on a single perfect plant at one point, it may be equally wise to leave out still more of the auxiliary advantages, and thus be able to benefit a still greater number of stations. The one idea to be kept uppermost is, the great advantage of having ready means of always warning approaching trains of danger a good distance before they reach the point of danger; and the only essentials to this are a post, a weighted lever upon it, and a cable to pull it with.

Electricity is an extremely simple means of securing a reasonable degree of safety from defective apparatus and other liability to failure, and it is a wonder it is not more used. Nothing is easier than to know how an out-of-sight semaphore

stands, by the use of a simple electro-magnet; and the battery can be kept in a warm room. Electric locking is to a certain extent very simple and feasible.

Now, don't let your readers overlook this letter because my name is so common-place. I've no doubt Charles Paine would have told them the same things if he had had the time. Print it in "leaded" lines, and if that doesn't have the desired effect melt the lead into globular form and use it in a more noisy manner.

EGO JONES.

The Protection of Trainmen.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It cannot be denied that there is a deep-seated conviction in the public mind that the railroad managers are not furnishing that protection to trainmen to which they are entitled.

This is evidenced in the passage of the Massachusetts act compelling railroads to adopt automatic couplers; in the Michigan act requiring the blocking of frogs; in the introduction at the last sessions of the legislatures of several states of bills of like import, and in the frequent expressions of the public press throughout the country.

It will be regretted if compulsory legislation on this subject becomes necessary, for the reason that the roads, if compelled to adopt hasty measures to meet the requirements of such legislation, will, in many cases, adopt devices which full experience will demonstrate to be impracticable, thus entailing heavy expense and labor and still not accomplishing the desired results.

The Massachusetts Coupling Act will stimulate investigation and experiment and hasten the adoption of some safer coupling device than that in general use, but it is a sad commentary upon both the humanity and enterprise of our railroad managements.

The three principal sources of danger to trainmen are coupling accidents, being thrown from the cars in motion and being caught by the feet in frogs, switches, etc., while making up their trains.

That the railroad managers are sometimes unjustly censured for not preventing coupling accidents is proved by the fact that among a large majority of their practical officers it is still claimed that no automatic coupler has yet been produced that can safely be relied upon to couple and draw the differently constructed cars found in the average freight train. This can only be determined by the faithful and protracted test of such couplers as seem to promise the desired results. Until this is accomplished legislation on the subject will be held in abeyance.

The second danger above referred to can, and should be, removed at once.

Admitting that the present construction of the tops of freight-cars, with their rounded surfaces and narrow foot-boards, is a necessity, and must be continued, and that the trainman must be an acrobat as well as a brakeman in order to avoid being thrown or slipped upon ice or snow off the top of the car, still a simple iron rod a few inches or even a foot high along the sides of the top of the car would—while it in no way interfered with its use—afford the falling man a barrier to which he could cling, and in hundreds of cases save his life. The expense of this device would be slight, and its adoption should be compelled by law if the railroad companies will not voluntarily use it.

The third danger, that of catching the feet in the angles or "bootjacks" of the frogs, switches, etc., is often entirely ignored by the management of wealthy and otherwise well-conducted roads, while these accidents occurring on them are of the most horrible nature, and attended by a far greater fatality than any other class of casualties.

Experiments made with various devices for preventing these accidents have developed their general uselessness on account of the necessity for leaving an open passage or flange-way between the rails; and of their liability to become split or displaced, and thus cause the derailment of trains.

There is, however, no objection to the small strip of oak bolted to the web of the rail, in use by the Flint & Pere Marquette, the Chicago, Rock Island & Pacific and the Chicago & Grand Trunk roads; and recently noticed by the writer, being placed in the tracks of the Old Colony Railroad in Massachusetts.

The flange-way between the rails is unobstructed, and the dangerous nature of the "bootjack" is entirely changed, so that the foot cannot be caught in it.

This would save hundreds of lives annually, if everywhere adopted.

It is inexpensive, easily put in, and its use should be compelled by legislative enactment if necessary.

Mr. Wm. S. Huntington, in a recent article, condemns the use of what he terms "wood blocking" for this purpose, and says: "Thousands of miles of track have been fitted with wood blocking that has disappeared, and a further trial of wood alone is useless." This must refer to wedge-shaped wooden blocks placed between the rails in the angles, or "bootjacks," and spiked to the ties.

But few roads are now trying to use these, as they continually become split and displaced, require frequent renewals, and with the utmost vigilance which can be obtained from the track-men, it is found impossible to maintain them.

JOHN H. ALLEN,

No. 163 South Clark street, Chicago, Ill.

FEB. 6, 1885.

Widening Gauge on Turn-out Opposite Frog.

CANON CITY, Col., Dec. 20, 1884.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Mr. Charles Paine, in a recent article in the *Gazette* suggests having guard rails trimmed at the shop instead of allowing trackmen to slot or cut away a part of flange

permit of placing the guard far enough from the frog to do its work effectively.

It is true that in common practice trackmen expend considerable time and labor in "butchering" guard rails, but this can be avoided, and the object sought better attained, by widening the gauge opposite to the frog on the turn-out. The following will illustrate the method referred to:

In laying a turn-out from tangent on standard gauge track with 1x9 frog, and 60 ft. lead from head-block to point of frog, the surface, gauge and alignment on main track should be first adjusted, and the lead rail, connecting with the frog on the turn-out, lined and secured in shape to produce a uniform curve from heel of switch to point of frog. Then lay off the 60 ft. space between point of frog and head-block in four sections of 15 ft. each, making chalk marks on main rail at points 15, 30 and 45 ft. in advance of frog. Follow with gauge and rule and tack down the off rail on the turn-out, with variations from standard gauge as follows:

Make gauge an inch wide 1½ ft. in rear of frog points, ¾ in. wide at first chalk mark ahead, ½ in. at second mark, and ¼ in. wide at last mark, 15 ft. from head-block. Then sight the intermediate spaces to a neat general line with those points, and spike regardless of gauge. The same rule can be applied in tapering out gauge variations to 60 ft. in rear of frog—except on cross-over, where the inch variation should be continued to the next frog, and tapered down to standard gauge at next head-block. Any competent trackman can sight and adjust a curved line based on those gauge points so neatly that any gauge variation will cause no perceptible break in the general alignment.

This arrangement will afford ample room to set the guard-rail a sufficient distance from the frog without any slotting or trimming, and give spikes on the off side more leverage to prevent the guard from turning inward than a trimmed or slotted flange would afford. In cases where the rail section has a wide base and narrow head, the gauge can be made 1¼ in. wide opposite the frog if necessary, and tapered out proportionately.

Many trackmen spike heads to snug gauge, or nearly so, and then endeavor by slotting and trimming to set the head of the guard rail 2 in. from the head of main rail, without any regard to distance from frog. This usually results in leaving guards ¼ to ½ in. too slack to afford a substantial bearing in guiding the wheel flanges clear of frog point and shoulder at throat of frog, both of which suffer serious injury if subjected to the continual grinding from wheel flanges that occurs when the guard is too slack.

The location of the guard-rail should be based on measurements taken from the gauge line of the frog, one at throat, and one about 2 ft. in rear of point. Making distance from gauge line of frog to working side of guard-rail 1¾ in. less than common gauge of track, i. e., when track gauge is 56½ in. make distance from gauge line of frog to far side of guard 54¼ in., and if frog has a 2-in. channel, the guard may be set out nearly to 55 in., but where frog has a narrow channel, care should be taken to avoid placing guard extremely far off, as in that case it would draw the wheels too severely against the near wing of the frog, and cause a tendency on the part of the frog and guard to pull the wheels apart on the axles.

Widening the gauge on curved lead not only clears the way for guard rail, but is also beneficial in easing off friction from track and rolling stock, especially in dealing with heavy engines having a long and rigid wheel-base.

This principle will apply to double and single turn-outs on any gauge, broad or narrow, and to all kinds of frog angles, as I have demonstrated by constant practice during many years past, both on standard and narrow-gauge track.

I introduced this idea a few years since on one of the most prominent roads in the West, and it was quickly adopted by a keen, observant engineer, who at that time had general charge of the track. He was a strong advocate of allowing gauge compensation for curvature in track and sought to improve on my idea by having switch rods made an inch longer than common, and widening the gauge correspondingly on both main track and turn-out from heel of switch to heel of frog, and tapering out to standard gauge 60 ft. from those points. Some engines then on the road had been manifesting much stubbornness against being cramped by the gauge and curvature of turn-outs, and frequently broke connecting-rods and switch-levers when going in on sidings; but the difficulty was greatly modified by the arrangement referred to, the worst feature remaining being an undesirable break in the alignment caused by gauge variation on main track, which could not be hidden like the variation on curved line turn-out.

It is scarcely necessary to take much pains with guard-rails on tangent, as wheels have no special tendency to crowd against the frog point when passing through on a straight line, but where the frog forms part of the outside of a sharp curve, as it ordinarily does on line to turn-out, then the guard must check the natural tendency of wheels to grind hard against the outward rail, or the frog point will suffer uncalled for injury. Mr. Paine evinces excellent judgment in his articles on the "Elements of Railroad," and it is not my intention to controvert any views set forth by that gentleman, but simply to contribute toward throwing more light on a subject that seems to require it. I have studied Huntington and Latimer, Trautwine, Parsons and others, on switch work, but the only thing I have found in print which nearly embodies my idea on this subject comes from Mr. Reed, of Georgia, in an article published in the *Gazette* some time ago. He recommends placing the guard-rail away from the frog to within 1¼ in. less than gauge of track, but says nothing about widening gauge to permit of doing this without trimming guard.

D. SWEENEY, Roadmaster.

TECHNICAL.

Locomotive Building.

The Baldwin Locomotive Works in Philadelphia are building for the Dom Pedro Segundo road in Brazil a locomotive with ten driving wheels and a two-wheeled truck. It has cylinders 22 by 26 in. and driving wheels 45 in. diameter. The boiler is 64 in. diameter of barrel and the fire-box is 120 by 43 in. inside. The engine is of 5 ft. 3 in. gauge and is intended to work a heavy grade.

The New York, Lake Erie & Western shops at Susquehanna, Pa., have begun work on an order for 12 new locomotives for the road.

The Manchester Locomotive Works in Manchester, N. H. are building seven locomotives for the Maine Central road.

The Brooks Locomotive Works in Dunkirk, N. Y., have taken a contract to repair and rebuild a number of locomotives for the Wabash, St. Louis & Pacific road.

The Rhode Island Locomotive Works in Providence recently delivered to the Worcester, Nashua & Rochester road a Mogul freight engine, with 18 by 24 in. cylinders. The boiler is 58 in. diameter of barrel, the fire-box 36 by 78 in. inside.

The Car Shops.

A report which has been in circulation that the work of removing the Pullman car shops from Detroit to Pullman had begun, and that orders had been issued to finish up all the work in the Detroit shops by March 25, in preparation for the transfer of the buildings there to other parties, is contradicted by authority. It is true that nothing but repair work has been done at the Detroit shops for some time past, all the new work having been done at Pullman, but there is no intention of closing those shops, and it is even probable that the force there will be increased.

The Gill Car Works property in Allegheny, Pa., has been sold at sheriff's sale under a foreclosure, to J. W. Chalfant and C. B. Herron, who held the mortgage and bid in the property.

The Muskegon Car & Engine Co. at Muskegon, Mich., has made an assignment. The liabilities are stated at \$80,000 and the assets at \$150,000. It is stated that arrangements are to be made under which the company will shortly resume work with increased capital.

The New York, New Haven & Hartford shops, in New Haven, Conn., have just completed two very handsome sleeping cars, and are now building two buffet parlor cars for the road. They are to be used on the through line between New York and Boston.

Bridge Notes.

The Boston Bridge Works are building an iron trestle bridge, 290 ft. long and 90 ft. high, over LaFayette Brook on the Profile & Franconia Notch road in New Hampshire. It replaces a wooden bridge.

Iron and Steel.

The Barre Forge and Furnace property in Huntingdon County, Pa., is said to be resold by the sheriff, the court having set aside the former sale on account of the failure of the purchaser to comply with the terms.

The office of the Scranton Steel Co. has been removed from No. 56 to No. 47 Broadway, New York.

Eight out of the 18 blast furnaces in the Mahoning Valley are now in blast, and several others are preparing to blow in. It is stated that Redbank Furnace in Clarion County, Pa., will go into blast about April 1. It has been idle since June, 1883.

The Coatesville Iron Works is a new company, which has bought the property of the Coatesville Iron Co. at Coatesville, Pa. It is stated that the works will be started up very soon.

Brown, Bonnell & Co. have put their Phoenix furnace at Youngstown, O., into blast.

Rising Fawn Furnace in Dade County, Ga., owned by the Walker Coal & Iron Co., will soon go out of blast for necessary repairs. The intention is to start up the furnace again as soon as the repairs are completed.

Manufacturing and Business.

Gould & Eberhardt in Newark, N. J., have recently completed and put in operation a rack cutting machine which is capable of dividing to the 1-10,000th part of an inch. This fine dividing was necessary to complete some special machinery in which certain parts must work in exact time with each other. The firm is getting out a lot of 24 and 30-in. upright drill-presses, which they claim are more simply and easily handled, and will do 20 per cent. more work than any heretofore made.

The Union Switch & Signal Co. in Pittsburgh is making a Saxby & Farmer interlocking apparatus for the Hannibal & St. Joseph road, and a pneumatic signal apparatus for the Oakland yard of the Central Pacific.

The Peerless Manufacturing Co., of Louisville, Ky., announce that its sales office will hereafter be at No. 15 Gold street, New York, under the control of Messrs. Thomas Prosser & Son. These nut-locks were last year put in for trial on the Louisville & Nashville; Chicago, Milwaukee & St. Paul; Ohio & Mississippi; Indianapolis Union; Savannah, Florida & Western; Wheeling & Lake Erie; Chicago, Rock Island & Pacific; Chicago & Northwestern; Atchison, Topeka & Santa Fe, and Indianapolis & Vincennes roads. The road-masters of these roads, without exception, report in January last that they are both cheap and effective.

Messrs. Humphreys & Sayce, formerly members of the firm of Barrows & Co., have established themselves as dealers in rails, railroad equipment and supplies at No. 1 Broadway, New York.

The Rail Market.

Steel Rails.—An active demand is reported for small lots, and quotations are firmer at \$27.50@\$28 per ton at mill for ordinary sections, and \$29@\$31 for light rails. Eastern makers are not inclined to go lower at present, although Pittsburgh mills are said to be willing to take \$27 cash.

Rail Fastenings.—Quotations continue nominal at 1.90@2 cents per pound for spikes in Pittsburgh, 2.25@2.60 cents for track-bolts and 1.65@1.75 cents for splice bars. Demand is still light.

Old Rails.—Old iron rails are quoted at \$18@\$18.50 per ton at tidewater, with no sales, buyers not being willing to pay so much. Old steel rails are quoted at \$16@\$17 per ton in Pittsburgh.

Brake Trials.

The Rote Automatic Brake Co. is anxious to have a public competitive trial of its freight brake and that of the Westinghouse Air Brake Co. made, and has issued a challenge to that effect.

Blast Furnaces of the United States.

The *Iron Age* says: "In another column we give our monthly report, showing the condition of the anthracite and bituminous furnaces of the United States on March 1, 1885. The table, in a condensed form, presents the following:

Fuel.	No.	—In blast—		—Out of blast—	
		No.	Weekly capacity.	No.	Weekly capacity.
Anthracite.....	96	22,889	134	30,305	
Bituminous.....	91	46,774	131	44,373	

"As compared with the report for Feb. 1, 1885, this shows an increase of five anthracite furnaces in blast, and an increase of four bituminous in the month of February. The chief changes among anthracite furnaces are in the Lehigh Valley, where four more are in blast, three more out in the Schuylkill, and two more in each of the Susquehanna valleys. Though several furnaces have blown in in Pittsburgh, others have gone out, and one less is in blast than on Feb. 1. One more is in blast in the Shenango Valley, one less in the Youghiogheny, three less in Virginia, two more in the Mahoning Valley, and three more elsewhere in Ohio.

"Since the first of the year our reports have shown the following as the number of furnaces in blast, and the capacity of the same on the first of each month:

Fuel.	—Jan. 1—		—Feb. 1—		—March 1—	
	In blast.	Capc.	In blast.	Capc.	In blast.	Capc.
Anthracite.....	86	21,504	81	21,180	86	22,889
Bituminous.....	82	36,812	87	41,633	91	46,774

"This shows the same number of anthracite furnaces in blast March 1 as Jan. 1, but a greater capacity. There are nine more bituminous furnaces, with nearly 10,000 tons greater weekly capacity."

A Dangerous Practice.

When a boiler has undergone repair it is a usual and very necessary practice to test it, not only to show the quality of the repairs, but also to find any other defects or weak parts which may have escaped notice. To test a boiler in such a case means to fill it with water and to apply pressure, "somehow," as it is often said, and, as the feed connections are often severed at these times, it of course means something else than the engine pump being used. To send to a boiler-shop for a test pump is in many cases considered too expensive, and the practice of filling the boiler with cold water, touching up any leaks, and then opening the junction-valve from the next boiler and applying pressure by turning steam upon the top of the water, is consequently adopted. A severer test for repairs can scarcely be imagined, the strains produced being considerably greater than under any possible working condition, and the repair work due to testing is frequently longer in hand than that before testing.—*Iron Age*.

American Steamboats for the Nile.

The *American Manufacturer* (Pittsburgh) says: "By request, Robert Lea, the engine builder, First and Ferry streets, on Monday forwarded to the British government plans and specifications of stern-wheel steamboats. Some time ago James Rees & Sons forwarded similar plans at the request of the same government. The request for the specifications came to Mr. Lea through government contractor Hemingway. Thirty of the boats are needed by Aug. 1. They are to be 150 ft. long, 30 ft. wide and 500 tons burden, and will cost about \$18,000 each. If the contract is awarded in this city it will give employment to a great many men, as the work will have to be hurried. The boats are intended for service on the Nile during England's wrestle with the Mahdi. We also see that Allen & Blaisdell, of St. Louis, iron boat-builders, have been asked to furnish plans and specifications for 30 iron hulls to be used by the British government on the Nile."

An Electric Railroad.

Work has been begun on the Baltimore & Hampden Railroad, which will be a suburban branch of the Union Passenger Railway Co., of Baltimore. The new road will start from Huntingdon avenue and Oak street, Baltimore County, and pass through the villages of Mt. Vernon, Hampden and Woodberry. The iron for the tracks has been distributed. It is the intention of the company to use electricity as a motive power in running the cars, modelled on the system in use on one of the long piers at Coney Island. The electric conductor will be a third rail laid in the centre of the regular rails. The cars will be drawn by motors with electric machinery. The contact between the electric rail and the motor is by a wheel, which runs over the rail, picking up the electricity. A motor, independent of the cars, is being made to try the experiment, and, if it is successful, it is likely that the future motors will be part of the cars, so that one man may run the motor and act as collector of fares too. It is claimed for the new system that it will be cheaper than horses; that there will be no noise, no smoke and no cinders, and that it will make from 8 to 10 miles an hour. The pressing of the finger against a button is all that is required to manage the motors. General Superintendent Robbins says that if the experiment turns out all right on this branch road, with its steep grades, the system will work satisfactorily anywhere. The length of the new road is 2¼ miles, and it is expected to be ready for use about the middle of April.

Rapid Railroad Construction.

A paper by E. T. Abbott, C. E., before the Engineers' Club of Minnesota, which appears in the *Journal of the Association of Engineering Societies*, gives an interesting account of the rapid building of 500 miles of the Canadian Pacific Railway, which fairly ranks among the great feats of the kind and may be summarized as follows:

May 18, 1882. Engineers reached the ground.
May 28, 1882. Broke ground first 50 miles.
June 13, 1882. Broke ground second 50 miles.
June 17, 1882. Track laid first 50 miles.
Jan. 1, 1883. Track laid, 435 miles.
Average daily work for 182 working days:
33,548 cubic yards excavation.
13.15 M. ft. B. M. timber.
471 lineal feet piling.
2.38 miles track-laying.

Force employed, 5,000 men, 1,700 teams.
About 150 miles ahead of the track was under work at once, camps being about 50 miles apart. Four trains of about 40 wagons each were engaged in hauling supplies, the amount required per day being 1,700 bushels of oats and 15,000 lbs. of provisions, hauled 50 to 150 miles, besides hauling timber, piles, tools, etc. Sidings, 1,500 ft. long were laid in every 7 miles, by a separate side-track gang with train. In the month of August 92 miles of track was laid. The ties were hauled an average of 270 miles and were laid 2,640 per mile. The grading was unusually heavy for a prairie road, in order to keep above the heavy snows. The contractors were Messrs. Langdon, Sheppard & Co., of Minneapolis, Minn.

Railroads at \$100 a Mile.

Wilkinson & Cole write to the *Northwestern Lumberman* from Mountain Creek, Ala., as follows:

"We use and prefer pole roads for logging, because they are cheap and do more work for the money invested than any other road. The average cost of building a pole road is \$100 a mile. We use poles, say 8 in. at the small end and 12 in. at the butt. A pole will last three times as long as scantling, because the face of the wheel is rounding, and the grain of the pole is circular. A pole road is a much better road than a person might give it credit for being, providing the cars and the locomotive are built to accommodate all the irregularities of the poles. One of the greatest advantages of a pole road is that the cost of building it is so little that we can afford to branch out into the timber, and thus make very short hauls with our teams. Some of our mill men haul to their logging roads two miles. We consider that three-quarters of a mile

Central Pacific.....	128	N. Y. Railroad Commission.....	31
Chesapeake.....	101	N. Y. West Shore & Buffalo.....	7
Chicago & Alton.....	133	Norfolk & Western.....	86
Chl., Milwaukee & St. P.....	101	Northeastern (South Carolina).....	151
Connoton Valley.....	71	Northern Central.....	135
Del. & Hudson Canal Co.....	101	Pennsylvania Railroad.....	150
Del., Lacka. Western.....	134	Philadelphia & Reading.....	37, 53
Fitchburg.....	23	Pitts. & Castle Shannon.....	128
Fort Worth & Denver City.....	37	Pittsburgh & Lake Erie.....	37
Hartford & Conn. Western.....	71	Portland & Rochester.....	7
Housatonic.....	167	Rochester & Pittsburgh.....	71
Huntingdon & Broad Top Mt.....	107	Rome Wat. & Ogdensburg.....	7
Illinois Central.....	53, 134	St. Paul & Duluth.....	134
Lehigh Coal & Navigation Co.....	128	Texas & Pacific.....	167
Lehigh Valley.....	128	Utica & Black River.....	128
Long Island.....	21	Virginia Midland.....	27
Maine Central.....	35	Worcester, Nashua & Roch.....	7
Missouri Pacific.....	87		

Chicago, Burlington & Quincy.

The advance statement of this company for the year ending Dec. 31 last shows that at the close of the year the company operated 3,467.4 miles of road, an increase of 144.9 miles during the year.

The expenditures during the year for new construction were \$4,047,953; for equipment, \$1,098,995; a total addition of \$5,146,948 to property account.

The stock and bonded debt at the close of the year stood as follows:

	1884.	1883.	Inc. or Dec.
Capital stock.....	\$76,450,147	\$71,941,246	I. \$4,508,901
Bonded debt.....	77,160,608	77,408,491	D. 247,883
Total.....	\$153,610,755	\$149,349,737	I. \$4,261,018

The funded debt includes contingent liabilities for branch lines, bonds of those lines guaranteed.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight.....	\$18,514,431	\$19,514,161	D. \$999,730	5.1
Passengers.....	5,339,806	5,285,819	I. 54,087	1.0
Mail, etc.....	1,029,315	1,310,360	I. 318,946	24.3
Total.....	\$25,483,612	\$26,110,360	D. \$626,747	2.4
Expenses.....	14,090,746	13,406,478	I. 684,268	4.4
Net earnings.....	\$11,392,866	\$12,613,891	D. \$1,221,025	9.7
Gross earn. per m.....	7.497	8.023	D. 526	6.5
Net earn. per m.....	3.352	3.870	D. 518	13.5
Per cent. of exps.....	55.3	51.7	I. 3.6	

Taxes are included in expenses. The average mileage worked for the year was 3,399 miles, against 3,255 in 1883.

The income account for the two years is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Net earnings.....	\$11,392,866	\$12,613,891	D. \$1,221,025	9.7
Interest, etc.....	566,770	324,181	I. 242,589	
Total.....	\$11,959,636	\$12,938,072	D. \$978,436	
Fixed charges.....	\$5,381,950	\$4,883,941	I. 498,009	
Dividends.....	5,566,580	5,556,484	I. 10,096	
Carried to renewal fund.....	500,000	1,500,000	D. 1,000,000	
Total.....	\$11,448,539	\$11,950,425	D. \$501,885	
Balance, surplus.....	\$511,106	\$987,647	D. \$476,541	

Fixed charges include rentals, interest and sinking fund payments. Dividends were 8 per cent. in both years. The receipts from land sales are not included in the account.

The report says: "During the year 30 1/4 miles of second track have been added in Illinois, 18 1/4 in Iowa, and 3 1/4 in Nebraska. The number of miles of second track on Dec. 31, 1884, was: In Illinois, 168 1/4; in Iowa, 43, and in Nebraska, 3 1/4."

"In Illinois and Iowa during the year 73 miles of steel rails were laid in branches and side tracks to replace iron rails; 48 1/2 miles of steel rails were laid in new second tracks, and 15 1/2 miles in new side tracks. The total number of miles of steel rails in all tracks east of the Missouri River on Dec. 31, 1884, was 1,453 1/4. This includes the whole main line in Illinois and Iowa."

"In Nebraska and Kansas during the year 42 1/2 miles of main line track, and 1 1/2 mile of side track were relaid with steel rails in place of iron rails; 109 miles of steel rails were laid in new main track upon the lines from Holdredge to Oxford, Aurora to Grand Island, and Odell to Concordia; 3 1/4 miles in new second track, and 1 1/4 miles in new side tracks, making the number of miles of steel rails in all tracks west of the Missouri River on Dec. 31, 1884, 731 1/4."

"The general condition of the entire road and equipment has been fully maintained during the year."

"The actual length of the road in operation Dec. 31, 1884, was 3,467.4 miles, against 3,322.5 miles Dec. 31, 1883, an increase of 144.9 miles."

"The properties controlled by this company, whose operations are not embraced in this report, show a falling off in net surplus for the year of about \$300,000, having earned about \$700,000 in 1884, as against \$1,000,000 in 1883, after paying their own operating expenses and interest on their outstanding liabilities not owned by the Chicago, Burlington & Quincy Co. The Kansas City, St. Joseph & Council Bluffs Co. paid during the year dividends amounting to 5 per cent. on its capital stock, yielding to this company the sum of \$263,040."

"The decrease in earnings in 1884 was due to increasing competition and a falling off of business, the actual tons moved having been 119,708 less than in 1883, in spite of an increase of 144 miles in the average length of road operated. The increase in the ratio of expenses to earnings is due in part to the same causes—lower rates and a less volume of business—and in part to the fact that, owing to a change in the law regulating the collection of taxes in Nebraska, we paid in 1884 the taxes for 1883 and also for 1884, the amount for the latter year having been about \$300,000 which under the old law would not have been payable till May, 1885."

"The falling off of business in 1884 is to be attributed to the dullness of trade generally."

Petersburg.

This company owns a line from Petersburg, Va., south to Weldon, N. C., 59 miles. Its report is for the year ending Sept. 30.

The equipment consists of 11 locomotives; 2 passenger, 1 postal and 2 baggage cars; 61 box, 4 stock, 64 flat and 3 caboose cars; 1 officers' car and 4 construction cars. This is an increase of 1 locomotive, 1 construction and 11 flat cars.

The general account is as follows, condensed:

Stock, preferred.....	\$323,500
Common.....	1,070,700
Funded debt.....	1,804,000
Accounts and balances.....	51,828
Profit and loss.....	28,585
Total.....	\$3,208,613
Road and property.....	\$3,079,157
Sinking car trust.....	18,000
Stocks of other companies.....	40,583
Current assets.....	29,628
Cash.....	43,245
	3,208,613

The funded debt consists of \$344,000 first 8s; \$560,000 Class A 5s, and \$900,000 Class B 6s. There are \$90,000

Class A bonds unissued, besides \$350,000 reserved to pay off the first mortgage bonds. Last year \$31,000 firsts and \$3,000 old seconds were paid and canceled.

The traffic for the year was as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Train-miles.....	11,131	126,634	D. 115,503	12.2
Passenger.....	81,697	45,105	I. 36,592	81.0
Freight.....	15,688	15,510	I. 178	1.2
Other.....				
Total.....	208,516	187,309	I. 21,207	11.3
Pass. car miles.....	549,466	547,211	I. 2,255	0.4
Freight car miles.....	1,249,311	974,784	I. 274,527	28.2
Service car miles.....	172,568	145,340	I. 27,228	18.7
Passengers carried.....	66,765	63,554	I. 3,211	5.0
Passenger-miles.....	3,713,263	3,272,133	I. 441,130	13.5
Tons freight carried.....	120,839	111,446	I. 9,393	8.4
Ton-miles.....	6,677,250	6,614,561	I. 62,689	0.9

	1884.	1883.	Inc. or Dec.	P. c.
Av. train load.....	33	26	I. 7	26.9
Passengers, No.....	82	146	D. 64	43.8
Freight, tons.....				

	1884.	1883.	Inc. or Dec.	P. c.
Av. rate.....	2.98 cts.	3.09 cts.	D. 0.11 ct.	3.6
Per passenger-mile.....	2.71	2.74	D. 0.03	1.1
Per ton-mile.....				

The earnings per train mile were: Passenger, \$1.37; freight, \$2.22; average for all trains, \$1.73.

The earnings for the year were:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Freight.....	\$181,214	\$181,340	D. \$126	0.1
Passage.....	110,481	101,009	I. 9,472	9.4
Mails, etc.....	55,437	52,830	I. 2,607	4.9
Total.....	\$347,132	\$335,179	I. \$11,953	3.6
Expenses.....	197,635	180,964	I. 16,671	9.2
Net earnings.....	\$149,497	\$154,215	D. \$4,718	3.1
Gross earn. per mile.....	5.884	5.681	I. 203	3.6
Net ".....	2.534	2.614	D. 84	3.1
Per cent. of exps.....	57.0	54.0	I. 3.0	

The increase in expenses was due to increased train service and more extensive renewals.

The result of the year was as follows:

Net earnings, as above.....	\$149,497
New equipment.....	\$5,910
Dividend on preferred stock.....	9,705
Interest on bonds.....	111,000
	126,615
Surplus for the year.....	\$22,882

During the year 450 tons of steel rails and 25,505 new ties were put in the track. There are now only 10 1/2 miles of iron track, and only six small bridges are of wood. The company has now \$16,000 invested in sleeping cars in use on the through line.

An agreement has been made for the full and free use of the Seaboard & Roanoke bridge at Weldon at a rental of \$5,250 yearly and one-half the cost of maintenance, this contract removing the restrictions formerly placed on the use of the bridge. An agreement has also been made permitting the Meherrin Valley road to cross this road at grade near Hicksford.

Cincinnati, New Orleans & Texas Pacific.

This company owns no road, but operates as lessee the Cincinnati Southern road, from Cincinnati to Chattanooga, Tenn., 335.8 miles, which is owned by the city of Cincinnati. The report is for the year ending Dec. 31 last, the third full year of the lease.

The equipment, which is owned by the company, consists of 61 locomotives; 27 passenger and 14 baggage cars; 1,307 box, 60 refrigerator, 95 fruit, 6 oil-tank, 248 stock, 370 coal, 284 flat and 36 caboose cars; 2 derrick, 25 boarding and 39 construction cars. There was an increase of 3 locomotives during the year.

The general account, condensed, is as follows:

Stock.....	\$3,000,000
Reserve for sinking fund.....	120,112
" renewal of rolling stock.....	24,054
Sundry accounts.....	454,051
Trustees Cincinnati Southern.....	361,989
Total.....	\$3,980,206
Equipment, etc., bought at lease.....	\$1,865,774
Additions to road and equipment.....	1,278,160
Materials.....	155,960
Bearer Creek & Clinu. Coal Co.....	63,466
Accounts receivable.....	450,699
Cash.....	120,874
Revenue account, debit balance.....	45,874
	\$3,980,206

Expenditures on capital account, for additions to property, in 1884 were \$271,887, of which the sum of \$122,900 was for equipment.

The traffic, as reported, was as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Train-miles.....	730,773	731,298	D. 525	0.1
Passenger.....	926,779	946,322	D. 19,543	1.8
Freight.....	594,173	543,959	I. 50,214	9.2
Service and switch.....				
Total.....	2,254,725	2,221,579	I. 33,146	1.5
Freight car miles.....	20,384,359	18,518,211	I. 1,866,148	10.1
Passengers carried.....	639,902	597,975	I. 41,927	7.0
Passenger-miles.....	28,867,376	27,449,005	I. 1,418,371	5.2
Ave. rate per pass. mile.....	2.26 cts.	2.31 cts.	D. 0.05 ct.	2.2
Tons freight carried.....	1,047,066	969,600	I. 77,466	7.9
Ave. receipt per ton.....	\$1.77	\$1.90	D. \$0.13	6.8

Of the freight car mileage 72.5 per cent. was of loaded cars. The average freight train was 28 cars. The freight tonnage includes company freight, 129,774 tons last year. The earnings per train mile were \$0.89 passenger and \$2 freight; average, \$1.25 gross and \$0.39 net.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight.....	\$1,855,856	\$1,843,781	I. \$12,075	0.7
Passengers.....	654,197	634,940	I. 19,257	3.0
Mail and express.....	90,703	63,128	I. 27,575	43.5
Miscellaneous.....	48,428	75,495	D. 27,067	35.8
Total.....	\$2,058,184	\$2,047,344	I. \$10,840	0.4
Expenses.....	1,836,974	1,851,321	D. 14,347	0.8
Net earnings.....	\$221,210	\$206,023	I. \$15,187	7.3
Gross earn. per mile.....	7.916	7.884	I. 34	0.4
Net ".....	2.446	2.371	I. 75	3.2
Per cent. of expenses.....	69.11	69.93	D. 0.82	

Expenses include taxes and terminal rentals. The earnings were reduced by the general depression of business; an improvement is expected from increased lumber traffic and the building of two new blast furnaces on the line.

The result of the year was as follows:

Net earnings, as above.....	\$221,210
Rent of road.....	\$800,000
Trustees' compensation.....	12,000
	\$812,000
Surplus for the year.....	\$9,210
Debit balance, Jan. 1, 1884.....	\$13,721
Reserve for sinking fund.....	41,363
	55,084
Debit balance, Jan. 1, 1885.....	\$45,874

The Chief Engineer's report shows that 1,361 miles of light steel and 21,330 miles of iron rails were replaced by 60-lb. steel. There were 116,365 new ties used and 64,686 cubic

yards of ballast put in, while 90,964 cubic yards of earth were used for filling trestles. New sidings built were 4.14 miles. General repairs were made to bridges and buildings, and a beginning was made on the work of replacing timber supports in tunnels with brick arching.

The Superintendent reports an increase in through traffic, but a decrease in local. He also urges the necessity of a change in gauge, and recommends the building of a passenger station in Chattanooga, and improvements at other points on the line.

The President's report refers at much length to the continued failure of the Trustees to provide adequate terminal facilities in Cincinnati, the lack of which not only caused a loss of traffic and much delay in business, but resulted in the addition of \$110,559 to the expenses, for rent of stations and tracks and switching charges. He complains that while the company has fulfilled all its obligations under the lease, the Trustees have refused to do anything to carry out their part of the contract. An early settlement of this question is necessary if the company is to continue operating the road.

The report also refers to the urgent necessity of a change of gauge from 5 ft. to 4 ft. 8 1/2 in., and to the loss and extra expense caused by the present change of gauge and transfer at Cincinnati.

South Carolina.

This company owns a line from Charleston, S. C., to Augusta, Ga., 137 miles, with branches from Branchville, S. C., to Columbia, 68 miles; Kingville to Camden, 38 miles, and Ten-mile to Phosphate Mine, 3 miles, making 246 miles in all. The report just issued is for the year ending Dec. 31.

The company also owns the Barnwell Railroad, 9 miles, but its operations are not included in the statements.

The equipment consists of 46 locomotives; 34 passenger, 1 sleeping, and 5 baggage, mail and express cars; 604 box, 14 stock, 158 flat, and 23 caboose cars; 2 officers' and pay cars, 1 commissary, 1 derrick, and 4 shanty cars.

The general account, condensed, is as follows:

Stock.....	\$4,264,160
Funded debt.....	\$847,198
Bills and accounts payable, etc.....	281,420
Income account.....	15,848
Total.....	\$13,348,626
Road and property.....	\$12,830,163
N. Y. & Ch. Warehouse Co.....	187,545
Barnwell R. R.....	70,616
Materials.....	88,789
Accounts and balances.....	118,053
Cash.....	53,460
	13,348,626

The funded debt consists of \$903,198 prior lien bonds of various issues; \$4,276,000 consolidated 6s; \$1,130,000 second consolidated 6s and \$2,538,000 income 6s. During the year \$261,000 consolidated bonds were sold and applied to the payment of prior lien bonds, as was also \$16,005 received for real estate sold. The trustees hold \$724,000 first and \$170,000 second consolidated bonds to provide for the remaining prior lines.

The company sold last year \$150,000 second consols at 96, to pay off floating debt. It still holds \$200,000 second consols and \$462,000 incomes.

The traffic for the year was:

	1884.	1883.	Inc. or Dec.	P. c.
Train-miles.....	332,970	340,984	I. 51,990	15.2
Passenger.....	544,063	627,050	D. 82,987	13.2
Freight.....	317,493	377,540	D. 60,045	15.9
Service and switch.....				
Total.....	1,254,528	1,345,574	D. 91,046	6.8
Passengers carried.....	273,655	228,676	I. 44,979	19.6
Tons freight carried.....	390,257	377,409	I. 12,848	3.4
Ton-miles.....	42,881,613	41,870,737	I. 1,010,876	2.4
Rate per ton-mile.....	2.12 cts.	2.35 cts.	D. 0.23 ct.	9.8
Cost ".....	1.45	1.57	D. 0.12	7.7

Receipts of leading articles at Charleston were, last year: 326,620 bales cotton, 37,667 barrels flour, 4



Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

THE CHICAGO, MILWAUKEE & ST. PAUL REPORT.

The report of the Chicago, Milwaukee & St. Paul Railway Company, coming as it does after a condensed statement of the income account, on which we have already made comment, will not attract as much attention as if it gave for the first time the net earnings of the year and their disposition. It is very brief, but affords means for tracing the course of traffic and the details of working expenses, and also a condensed balance sheet.

The passenger traffic, which had increased rapidly for years, decreased 4 per cent. in 1884, though there was an increase of 9 per cent. in the mileage of passenger trains, the average passenger train-load having fallen from 44 in 1883 to 38½ last year.

While the decrease in passenger traffic was 4 per cent., the decrease in passenger earnings was but 2.7 per cent., the average rate per passenger per mile having increased from 2.52 to 2.55 cents. This is probably due to a reduction in the proportion of the immigrant traffic, which is carried at low rates.

The freight traffic increased 6 per cent. last year, against an increase of 24 per cent. in 1883, 35 per cent. in 1882, and 38 per cent. in 1881—a decided check in the rate of increase, which, however, accompanied a check in the increase of mileage, which was 5 per cent. last year. Taking both traffics together, there was an increase of about 5 per cent., or as much as the increase in mileage. The increase in the freight traffic was carried with a decrease of 2½ per cent. in freight-train mileage, and the average freight-train mile increased from 86 to 107 tons. Switching is included in the freight-train mileage, and that greatly reduces the average freight train load, though it should not greatly change the comparison, as the proportion of switching mileage is not likely to have changed greatly. Allowing for this, the average freight train load is an extremely light one, as is the average passenger train also. This apparently is not due to unevenness of traffic in the two directions, for the two currents are unusually even or like in amount, in this differing greatly from the trunk lines, which carry three or four tons east to one west. It is probably largely due to the thinness of the traffic on a large part of the mileage, where for the convenience of the community it is necessary to run trains at not very great intervals, though there may not be a quarter of a load for them. It follows from this that when traffic has greatly grown on these lines it will be possible to carry it all without greatly increasing the train mileage, and consequently without a great increase in the working expenses.

Notwithstanding the increase of 6 per cent. in freight traffic, there was a decrease of 1½ per cent. in

freight earnings, the average rate having fallen from 1.39 to 1.29 cents per ton per mile, or 7 per cent.

The decrease in these two great traffics amounted to no less than \$397,214, which is 83 cents per share of stock, but it was more than half counterbalanced by an increase of no less than 15½ per cent. in the earnings from mails, express, etc., amounting to \$208,889. The minor sources of earnings, which usually are hardly considered worth notice, also increased very largely on the Chicago, Burlington & Quincy last year (\$319,000=24 per cent.), and made a very welcome addition to the profits of a year when earnings generally decreased.

This company's system has been growing so fast that it is impossible to see how the traffic of the country on its lines has been growing. We have no means of knowing positively how much of the increase in the aggregate traffic of the system has been due to the additions to the mileage, and how much to growth of business on the old lines. The average traffic has been kept very thin by building new lines into new country which afforded very little traffic. Last year, however, the additions to road were comparatively small, and apparently no further considerable additions are now contemplated, so that a chance will be given for the traffic to grow more rapidly in density. More rapidly, we say, for in spite of the new road the density of traffic has increased materially, and last year was decidedly larger than in any year before the additions to mileage began. That the earnings per mile have not increased is due to lower average rates. Below we give the average mileage worked, the average traffic per mile, and the gross and net earnings per mile, for each of the last eight years. The figures for traffic are the numbers of passengers and tons of freight, which, carried each way daily over the whole length of the mileage worked, would make the total passenger-miles and ton-miles of the year. Thus, there having been 225,851,000 of passenger-miles last year, and an average of 4,780 miles of road worked, the average passenger traffic per mile of road was 47,250 passenger miles, equivalent to a movement of 47,250 passengers over the whole length of the road. Divided by the number of days in the year, this gives 129 as the average daily movement of passengers over the whole mileage, and 64½ as the average in each direction. This measures the average density of passenger traffic.

Year.	Miles worked.	Daily traffic—per mile.		Earnings—per mile.		Average rate—per mile, cts.	
		Pass.	Freight.	Gross.	Net.	Pass.	Freight.
1877....	1,403	54.6	265.1	\$5,784	\$2,548	3.21	2.08
1878....	1,539	58.3	286.5	5,482	2,378	3.09	1.80
1879....	1,996	53.6	270.1	5,016	2,274	2.93	1.72
1880....	3,775	40.4	182.5	4,777	2,128	2.84	1.76
1881....	3,830	49.3	249.4	4,445	1,751	2.86	1.70
1882....	4,296	65.9	301.4	4,746	1,909	2.58	1.48
1883....	4,549	70.9	354.2	5,201	2,172	2.52	1.39
1884....	4,780	64.6	356.6	4,810	2,011	2.55	1.29

The immense increase of 90 per cent. in the average mileage worked from 1879 to 1880 was followed at first by a large decrease in the traffic per mile; but there was a quick recovery, and by 1882 the density of the traffic, in spite of hundreds of miles in Dakota, where very few people lived when the road was built, was greater than in any previous year. The freight traffic has increased decidedly since, and last year the traffic per mile was nearly a fifth more in passengers and a third more in freight than in 1877, before the company began to make additions to its road.

This density of traffic should be studied before forming a judgment on the policy of the company's managers in so greatly extending the system. There is scarcely any duty more delicate and important than that of what extensions a railroad on the border of unsettled country shall make, and when to make them. To build a railroad long before the time for it may be as fatal for investors as to build one where it is not needed at all; but to start too late may be fatal also. In such a situation railroad managers must manoeuvre for position, like a general in the face of an enemy. If they delay, the enemy may occupy the positions. Now the Milwaukee & St. Paul did not delay. Almost as soon as there were any signs of growth in the country occupied by its system and west of it, it began building and buying railroads at a tremendous rate. Nothing could justify this course but the conviction that this country was on the eve of a great growth in population and production. If there should not be such growth, traffic and earnings per mile would be very much reduced, and the interest on the cost of the unprofitable new lines would absorb all the profits of the old ones, or more, and precipitate the company into bankruptcy. But actually the increase in traffic, we see, taking the system as a whole, has more than kept pace with the increase in mileage. Doubtless many of the new lines have still a very thin and unprofitable traffic; but there is no longer any doubt that the country on them will grow rapidly, and that at no distant day they will be profitable.

The earnings have not kept pace with the traffic,

but as everywhere west of Chicago there has been a large reduction in the average rates, since 1877 amounting to 20 per cent. in the passenger and 38 per cent. in the freight rate, and even since 1880 to 10 and 26 per cent. respectively. This reduction in rates was inevitable and doubtless will continue for some time yet, though probably not so rapidly as heretofore after a little, though increased competition of vessels on Lake Superior may have a considerable effect very soon. The new lines in Dakota are very distant from market, and it is necessary to make rates moderate when distances are so great, and the increase here, where there is so much room to increase, will be chiefly of traffic hauled a long distance at a low rate.

This is a question that concerns all the Chicago railroads closely. That they have been able to make better returns to their stockholders than the railroads further south and east—than the Wabash, the Vandalia Line, etc.—has been chiefly due to the fact that they were able to secure higher rates. But the rates continually tend downward, and though they are not likely to fall so low as those of the railroads from Chicago to the East, which are kept down by lake competition, they are getting nearer and nearer to them, and should the reduction continue for a few years at the rate of a few years past, they will be getting little more than trunk line rates, without possessing the heavy trunk line traffic which makes some of the trunk lines profitable in spite of the low rates. It is not probable that it will continue at so rapid a rate, however, except possibly on lines from Chicago to St. Paul, in consequence of Lake Superior competition.

In spite of the lower rates, however, the Milwaukee & St. Paul net earnings per mile, as we showed lately, have been pretty well maintained, though considerably less than in years previous to 1880, when the greatest addition of mileage occurred.

When a railroad is so largely new, great fluctuations of maintenance expenses are possible, and it may easily happen that the expenditures of a year, when everything has been fully maintained, are much below the depreciation due to the traffic of the year. And when hard times come and the necessity for retrenchment is felt, great savings are often shown by postponing repairs that ought to have been made. Therefore these expenditures deserve particular attention now. For eight years the expenditures of this railroad for renewals of track and for repairs of road, per mile of track, for repairs of cars and locomotives per car and locomotive, and the total maintenance expenses have been:

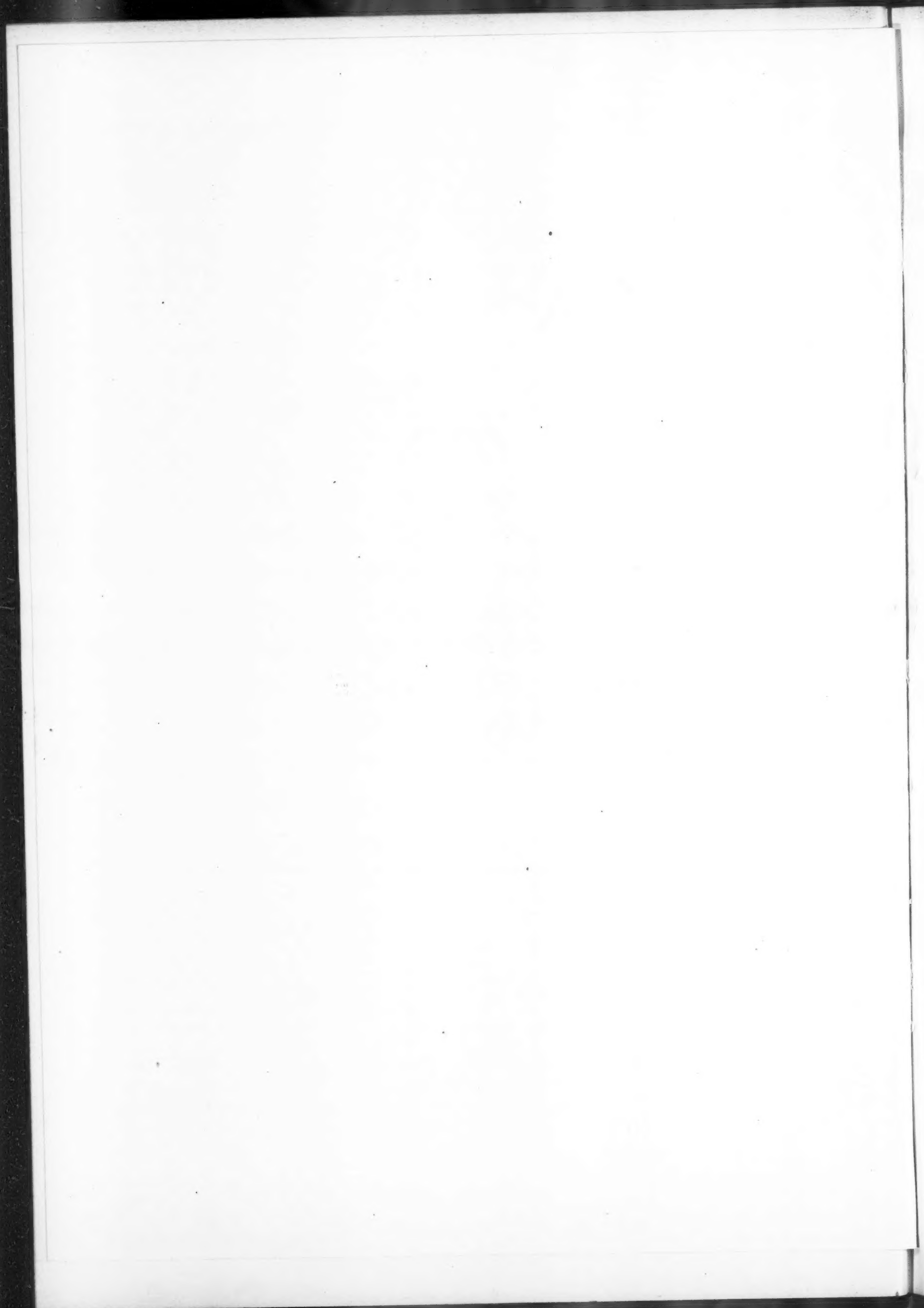
Year.	Pr. mile—track.		Repairs—Per loco.		All main—tenance.	
	Repairs.	Per car.	Repairs.	Per loco.	Total.	Per train mile.
1877....	\$277	\$494	\$74.60	\$1,349	\$1,495.378	\$1.050
1878....	145	431	81.70	1,236	1,594.025	1.036
1879....	140	414	62.60	930	2,152.900	1.079
1880....	160	306	46.00	948	3,247.727	860
1881....	89	400	40.85	1,076	3,727.467	973
1882....	52	396	55.00	1,321	4,478.933	1,043
1883....	64	356	73.80	1,450	5,037.864	1,107
1884....	61	369	70.00	1,512	4,914.072	1,028

The rail renewals last year were equal to about 4 per cent. of the whole road, which would very likely equal or exceed the average yearly requirements, were not so large a part of the track still laid with iron rails (2,615 out of 4,804 miles of road). The other track repairs were less per mile last year than in any other except 1880, and 18 per cent. less than in 1883. The car repairs were 5 per cent. less per car than in 1883, but were much above the average of other years since 1878, when they were doubtless much less than the average requirements. The expense per locomotive was larger than ever before, though there was little increase in the train mileage per locomotive. The total maintenance expenses, with an increase of 5 per cent. in average mileage worked, and of less than 1 per cent. in train mileage, were reduced by the small amount of \$123,792, or 2½ per cent., and the maintenance per mile of road fell off 7 per cent. and per train-mile 4 per cent.—probably much less than on most railroads last year, when lower prices of materials and in some cases lower wages helped to keep these charges down. These expenses have previously been very low on the Milwaukee & St. Paul road, however, and last year we see that they were lower per train-mile than ever before, and 22 per cent. less than in 1881.

The unfunded debt of this company has sometimes reached very large proportions, and the immediate financial policy of the company may be seriously affected by it. No corporation of this extent can avoid having very large liabilities of this kind, whatever its resources may be, and the amount can be called excessive only when it exceeds the income that will be available at the time the accounts payable should properly be paid. Generally it would seem that what should be called the working capital—the stock of materials on hand, the earnings in course of collection, and the cash on hand—should equal the unfunded debt—bills and accounts



SHEREBURN S. MERRILL,
LATE GENERAL MANAGER : CHICAGO, MILWAUKEE & ST. PAUL RAILWAY.
[ACCOMPANYING THE RAILROAD GAZETTE FOR MARCH 20, 1885]



payable. But this has not been the case with the Milwaukee & St. Paul. By including its investments in St. Paul & Duluth stock and coal lands in the assets, and excluding the interest due the day after the date of the report from the liabilities, the assets will be made to exceed the current liabilities; but the items named should be covered by the stock and bonds as much as the road and equipment. The assets other than road and equipment, and the liabilities other than stock and funded debt, have been given as follows in the last three reports for Dec. 31, to which we have added the interest due Jan. 1 following:

<i>Assets :</i>	1884.	1883.	1882.
Balances due.....	\$300,941.69	\$377,764.03	\$220,986.62
Materials.....	1,485,304.70	1,225,049.12	1,405,112.67
Bills receivable.....	845,147.62	1,173,469.32	1,780,108.90
Cash.....	2,971,132.55	3,048,964.89	2,969,732.42
	\$5,600,556.86	\$5,822,240.31	\$6,826,078.58
St. P. & D. stock and other investments.....	1,228,283.35	1,161,980.00	.....
Coal lands.....	680,475.01	.....	.....
<i>Liabilities :</i>			
Bills payable.....	\$1,304,373.79	\$1,540,124.81	\$2,718,793.48
Vouchers and pay-roll.....	1,610,660.86	1,732,087.29	2,216,629.84
Miscel. accounts (current balances).....	688,998.90	77,488.53	2,141,916.27
Unclaim. div. and int.....	89,790.92	93,487.65	83,162.89
	\$3,703,824.47	\$3,443,787.98	\$7,160,502.48
Int. due Jan. 1.....	2,885,005.00	2,778,307.50	2,592,137.50
Total.....	\$6,588,829.47	\$6,222,094.78	\$9,752,639.96

All the cash on hand Dec. 31 last, except \$86,127, was required for the interest due Jan. 1, and the total liabilities of the unfunded debt at that time exceeded the assets which were available for transformation into cash by \$988,273, against \$400,000 in 1883, and \$2,926,000 in 1882.

The company usually pays a half-yearly dividend April 15. At the beginning of this year there was but about \$56,000 of cash available for this purpose; but very little of the net earnings of the following 3½ months are required for interest payments falling due meanwhile (less than \$200,000), and net earnings for this time last year probably amounted to about \$2,200,000. A 3 per cent. dividend requires about \$1,660,000. The money for the dividend is likely to be earned this year, therefore, and if one is not declared it will probably be because it is desirable to reduce the floating debt, or to make expenditures for improvements properly chargeable to capital account, but for which capital cannot easily be obtained at this time by the sale of securities.

The Chicago & Grand Trunk Railway has been a great success, so far as securing traffic is concerned, gaining every year, and more last year (in freight) than in any other, but so far as securing profits is concerned, that remains for the future, its average rates being perhaps the lowest in the country. Its freight traffic in *millions of ton miles* has been :

1880.	1881.	1882.	1883.	1884.
160.1	228.6	243.9	301.2	376.8

Last year the increase over 1883 was 25 per cent., over 1882 55 per cent., and over 1880 135 per cent.

The earnings, expenses and charges for interest, etc., meanwhile have been:

Year.	Gross. earn.	Expenses.	Net. earn.	Charges.
1880.....	\$1,383,633	\$1,159,860	\$223,773	\$223,660
1881.....	1,631,751	1,432,025	199,726	198,455
1882.....	2,271,087	1,801,442	469,645	470,393
1883.....	2,976,561	2,201,547	775,015	775,116
1884.....	3,178,180	2,415,503	762,677	760,723

The gross earnings have increased continuously, but not the net earnings, and the latter barely cover the interest charges, etc., in the best of years. The capital expenditures have had to be increased year by year, to provide for the growth of traffic, but how much last year we have not yet learned.

The success of this road is not to be judged by its own profits alone, but by the profitable traffic which it secures for the Grand Trunk. It was built for this purpose, and it may be profitable to the owner, which is the Grand Trunk, even when it does not earn interest on its bonds. Evidently it has secured to it a very large amount of through traffic, but it is not so certain that it has been a profitable traffic. In some years probably it has not been profitable, and 1884 was probably one of those years. As the Chicago & Grand Trunk then earned on the average but 0.57 cent per ton per mile on all its freight, its average through rate must have been less, and less on the Grand Trunk also, and it is not probable that it can make much out of a rate lower than that.

The large traffic that the road has secured, however, will add materially to the profits of the Grand Trunk whenever reasonable through rates are secured, as they probably will be some day. The road may not be able to increase farther the *share* of the through traffic it has recently secured, but it is pretty sure to continue to secure a considerable share and a large amount, and a little advance in the rate will greatly increase its profits. Last year, for instance, a rate of $\frac{1}{4}$ cent per ton per mile (which is what the Pennsylvania Railroad received then) would have added \$678,000 to its net earnings.

ings, which is more than 10 per cent, on its stock. Remunerative rates are what the road needs now. It has plenty of traffic, but it is hardly worth having at current rates either to the Chicago & Grand Trunk or the Grand Trunk.

Widening Gauge on Curves.

A careful discussion of this question appears in the *Railway Engineer*, translated from the French of M. Michel, with the conclusion that it is not expedient, for the reason that the front outer wheel always presses, under any circumstances, against the outer rail, so that no play is needed, while the rear wheels are said always to press against the inner rail, so that that axle also is not in need of extra play. On the contrary, if no extra play be given it is said that the effect is beneficial, in that the angle at which the front outer wheel stands to the rail is diminished. The only case in which the utility of extra play on curves is recognized is when three coupled axles have to pass around sharp curves. The almost universal expedient for such cases in this country, using a "blind" or flangeless tire on the middle axle, is not referred to.

These conclusions are in accordance with those which are meeting increasing acceptance in this country, and are now being practically acted on by many leading lines, which lay all new rails to the same gauge on both curves and tangents, unless the former are exceptionally sharp. A practical reason for this not referred to in the paper is that the gauge on curves is sooner or later much enlarged, and quite rapidly on sharp curves or under heavy traffic, by the flange wear on the outside rail, a wear which is not appreciably if at all affected by the amount of play in gauge. If, therefore, the gauge be made wide in the beginning, it is liable to become dangerously wide before the rail is fully worn out, especially on sharp curves, for the flange will and does in such cases bury itself down to the point in the original section of the rail, before the section is so reduced as to be dangerous, enlarging the gauge in some instances which have been noted and illustrated in these columns by $\frac{3}{8}$ to $\frac{1}{2}$ of an inch.

On the other hand, a worn inside rail is usually almost flat on top, and so far from giving any indication of flange wear, has very frequently, if not most commonly, a projecting bur of metal pressed outside the original section on each side of the head. This fact alone is enough to throw grave doubt upon the correctness of the statement that the rear inner flange always presses against the inside rail, although it is reported to be "the result of very accurate observations and experiments." Further doubt is thrown upon this by an observation which may be made in any yard by walking behind a car which is being slowly pulled around a sharp curve a little wide of gauge. The true action of the rear wheels is then quite easily seen, and they will be found, as a rule, to stand away from both rails, the occasional approximations to the one rail or the other being easily explicable as due to irregularities of the curve. Observation of this curious fact led the writer some years ago to construct some models for the purpose of testing the law of the position, the apparent result of which, whether with wheels truly cylindrical or excessively coned, was as follows:

- (2) The rear axle then assumes a position precisely radial to the curve, or, in other words, stands away from the outside rail by a distance equal to the versed sine of an arc of the length of the wheel-base, which for various wheel bases on various curves, is as follows:

		Wheel-base.	
		5 ft.	10 ft.
1° curve (5,730 ft. radius).....		0.025 in.	0.105 in.
5° " (1,146 " ")		0.13 in.	.52 in.
10° " (573 " ")		0.26 in.	1.05 in.

Whenever the play of the gauge is less than that indicated by the table above, the rear inner wheel will, of course, press hard against the inner rail, but not otherwise. With ordinary American wheel-bases this will rarely be the case, but with the long wheel-bases of rolling stock not of the American type, it is clear that it may very frequently happen, so that, for such rolling stock, the statement that the rear inner flange always crowds against the inside rail may be true enough. Still, it is well that the cause of this action should be recognized, that it is due simply to the length of the wheel-base and not to the law of its motion on a curve. The gauge has only to be increased to stop the flange contact on the inside rail, whereas no change in play can materially affect the grinding on the outside rail, since it depends on other causes.

Government Land Entries in Dakota, Minnesota and Wisconsin.

The St. Paul *Pioneer Press* has collected statistics of the entries of government lands in Dakota, Minnesota and Wisconsin (in 1884 and 1883), which, though incomplete in some important particulars, still have a great deal of significance. The acres which were entered in the two years, in those land districts for which it is given for both years, have been in Dakota.

<i>Land office:</i>	1884.	1883.	Decrease.	P.c.
Aberdeen.....	1,111,646	1,363,840	252,194	18.4
Fargo.....	806,240	4,040,160	3,173,920	78.6
Mitchell.....	899,053	1,448,154	625,501	43.1
Grand Forks.....	830,757	1,655,555	791,038	48.5
Yankton.....	345,249	1,248,498	343,318	27.5
Bismarck.....	318,080	433,589	83,340	20.4
		2,292,554	1,973,874	86.1
Total.....	5,208,965	12,457,150	7,248,185	58.2
Huron.....	1,948,730			
Devil's Lake.....	535,928			
Deadwood.....	282,125			
Total.....	7,975,648			

Unfortunately, the statements do not show what, if any,

part of the entries in 1883 were by railroad companies on account of land grants. There were none in 1884. The enormous decrease in entries from 1883 to 1884 was probably due to the smaller supply of desirable land.

Whether there was a similar reduction in the other districts we cannot be sure. The Devil's Lake district has not been open to settlement long. In the Huron district the number of entries decreased from 27,429 in 1883 to 13,881 in 1884, and we may presume that there was a very large decrease in the acreage entered there.

In Minnesota the acres entered were :

<i>Land office:</i>	1884.	1883.	Decrease.	P. c.
Crookston.....	392,352	699,750	277,398	41.4
Duluth.....	246,212	516,371	270,159	52.3
St. Cloud.....	105,766	566,062	460,296	74.3
Fergus Falls.....	130,522	310,205	179,683	57.9
Beacon.....	11,636	276,276	164,640	59.5
Taylor's Falls.....	24,758	32,285	7,537	9.3
Worthington.....	49,206	81,046	31,840	38.0
Tracy.....	59,873	84,236	24,363	29.0
Redwood Falls.....	72,784	374,720	301,936	86.6
Total.....	1,202,109	2,749,464	1,547,355	56.3

The percentage of decrease here is nearly the same as in Dakota, but the amounts are much smaller.

Three of the land districts in Dakota and Minnesota, Fargo, Grand Forks and Crookston, are in the Red River Valley. The entries in these three were 5,958,408 acres in 1883 and 2,408,772 in 1884—a decrease of 60 per cent. Yankton, Mitchell, Huron and Aberdeen are in the James River Valley. Omitting Huron, the acreage of which is not given for 1883, the sales at the other offices were 3,245,583 in 1883 and 2,279,548 in 1884—a decrease of 30 per cent.

The entries in Wisconsin are reported as follows:

<i>Land Office :</i>	1884.	1883.	Decrease.	P. c.
Wausau.....	88,429	159,343	70,914	48.0
Menasha.....	49,983	62,498	12,485	20.0
Eau Claire.....	76,237	78,537	2,300	3.0
La Crosse.....	38,874	58,220	19,346	36.3
St. Croix Falls.....	46,241	54,484	8,243	15.1
Bayfield.....	45,000	58,167	13,167	22.6
Total.....	339,764	471,220	131,456	27.9

The entries here are not one-third those of Minnesota and not a twentieth of those of Dakota. Nearly all are in the timber country. The decrease, it will be noticed, is much less in proportion than in Minnesota and Dakota.

It must not be assumed from the great decrease in land entries in Dakota and Minnesota that there is likely to be a check in area of land brought under cultivation. The land entries in a new country are very largely speculative. People rush in to secure the choice land, and only a very small fraction of what they take is brought under cultivation for years. We see that within these two years more than 20,000,000 acres were entered in Dakota; yet last year the area of wheat, oats and corn there was but 2,320,000 acres, and its total area of plowed ground was probably not more than 2,600,000 acres. The production depends chiefly on the farming population and their capital. The farmers are likely to bring more new land under the plow every year until they have all they can cultivate or their land is all in use. Evidently they can increase their production many times should there never be another acre of government land taken. But it is true that the rapidity with which the territory is populated depends largely on the amount of valuable government land that may be had for the taking. There was an enormous area of this land, and it caused a great rush of settlers and others; evidently now there is much less of such land; and it is the profits of farming rather than brilliant land speculations that will have to be depended upon hereafter to attract settlers. These profits from last year's crops were doubtless not very tempting, and therefore we should not expect the territory to grow very fast this year in population. But as all the ground broken last year will bear a crop for the first time this year, and as the settlers of that and previous years are constantly striving to increase their production, the area sown this year will probably be much larger than ever before.

The Locomotive "Decapod."

The Baldwin Locomotive Works have just completed an enormous engine of the "Decapod" or ten wheels coupled type, for the Dom Pedro II. Railroad of Brazil. This line is on the Irish or 5 ft. 3 in. gauge, the few inches of extra width, as compared with the standard gauge, being of course favorable to the construction of an unusually large engine. We give the dimensions of this engine below, and add for the sake of comparison some figures as to other exceptionally large engines.

Railroad.....	Brazil.	Southern Pacific.*	Southern Pacific.*	Northern Pacific.*
Type of Engine.....	Decapod.	El Gobernador.	Mastodon.	Consolidation.
Actual weight in working order, exclusive of tender, lbs.....	144,000	146,000	123,000	114,000
Actual weight of driving-wheels, lbs.....	128,000	128,000	102,700	97,000
Estimated weight of tender, including coal and water, lbs.....	80,000	80,650	63,000	70,000
Estimated weight of engine and tender, in working order, lbs.....	224,000	226,650	186,000	184,000
Cylinders.....	22x30 in.	21x30 in.	20x30	20x24
No. of drivers coupled.....	ten	ten	eight	eight
Driving-wheels, diameter.....	45 in.	57 in.	56 in.	49 in.
Total wheel-base.....	24 ft. 6 in.	15 ft. 11 in.	15 ft. 9 in.	14 ft.
Driving wheel-base.....	16 ft. 11 in.	19 ft. 7 in.	15 ft. 9 in.	14 ft.
Roller wheel-base.....	12 ft. 7 in.	15 in.	.....	.....
Bogies, diameter.....	64 in.	.....	74 in.	50 in.
..... thickness of plates.....	7 in.	.....	7 in.	5 in.
Firebox, inside length.....	121 in.	.....	108 in.	103 in.
..... width.....	30 in.	.....	34 in.	42 in.
Tubes, number.....	268.	.....	166	256
..... material.....	steel.	.....	steel	steel
..... diameter outside.....	2 in.	.....	2 in.	2 in.
..... length.....	13 ft. 9 in.	.....	12 ft. 12 in.	12 ft. 6 in.
Tank capacity, gallons.....	3,500	3,600	3,000	3,600
Tractive force per lb., average pressure in cylinders, lbs.....	279.6	278.6	226.4	196

* For illustration and description of these engines see *Railroad Gazette*, Jan. 18, 1884, pages 48, 52; Oct. 20, 1882, pages 642 to 647; and June 22, 1883, pages 402, 403.

It is estimated that the "Decapod" will haul 500 gross

tons or 1,120,000 lbs. of cars and lading up a straight grade of 2 per cent. or 105.6 ft. per mile. We understand that the Mastodon on the Southern Pacific has conveyed 20 loaded cars, weighing 844,000 lbs., up an incline of 116 ft. to the mile. Allowing for the differences in tractive power and grade, these performances seem to be of equal merit. The "Decapod" is calculated to work round curves of 330 ft. radius.

The name "Decapod" (ten-footed) of course refers to the ten drivers which transmit the tractive force of this immense engine. The term is applied by naturalists, however, to not very powerful organisms—to crustaceans such as crabs and lobsters.

The Late George Whitney.

George Whitney, the senior member of the firm of A. Whitney & Sons, car-wheel manufacturers, of Philadelphia, died in that city on Thursday, March 5, in the 68th year of his age. The following particulars of his life are taken from the Philadelphia Ledger:

"He was born in Brownsville, N. Y., and educated at the Albany Academy, of Albany, N. Y. He adopted the profession of civil engineering, his first field work being on the railway between Hartford and Springfield, Conn., and his next, under the same engineer, on the survey and construction of the Genesee Valley Canal, in New York.

"In 1843 Mr. Whitney came to Philadelphia, his father having formed a partnership with the late Mr. M. W. Baldwin, the founder of the present Baldwin Locomotive Works, and was employed by that firm in a prominent position until its dissolution in 1846.

"In 1847 he entered into partnership with his father under the title of A. Whitney & Son, for the purpose of manufacturing chilled cast-iron car wheels under patents granted to the senior partner, the late Mr. Asa Whitney. The extensive works, covering the ground between Callowhill street, Pennsylvania avenue and Sixteenth and Seventeenth streets, were erected a few years later and were then said to be by far the finest and most substantial, as well as the largest, devoted to this specialty in the country.

"At the time of his death he was a member of the board of trustees of the University of Pennsylvania, a director in the Insurance Company of North America, the Philadelphia National Bank, Philadelphia Saving Fund, and the Lehigh Coal and Navigation Company. He had also been a member of the Committee of One Hundred, and was much interested in the cause of civil service reform."

At a meeting of the employees in the works of A. Whitney & Sons, held on March 9, the following resolutions were adopted:

"Death, not unexpectedly, has taken from us our senior employer, our genuine friend, our esteemed George Whitney. Through all the mutations of business he has been our guide and dependence; always dealing generously and wisely with us in times of prosperity, and in seasons of depression ever considerate beyond our reasonable expectation. In all the years we knew him his patient, faithful adherence to duty and oft-rejected opportunity for needed relaxation made him seem more our fellow-workman than one in high authority over us.

"We hear of his well deserved appreciation among those with whom the circumstances of social and business life gave exercise to the winning grace of manner and rare common sense that distinguished him. We know of the real affection among ourselves that responded to his always kind and cheery word, whether of greeting, counsel, or chiding; his gentle action, and the ever ready disposition to aid the worthy. We know that even in the years when his own poignant bereavement and after-failing health sat heavily upon him, the sunshine of his noble heart came into his fine face when the little troubles of some one among us were laid before him, and his encouraging words sent us away comforted.

"Such a character as his worked its natural influence upon our hearts, for none of life's conditions can repress the responsive good of human nature. All of us were conscious of an ever eager desire to personally serve him in some wished for opportunity that never came; and if our association had been other than amid the peaceful pursuits of life, we would have willingly followed him to the extremity of death in our devotion to his cause.

"We grieve for him as an exceptional man among men. We tender our heartfelt sympathy to his bereaved family and kindred, to whom we present a copy of this humble tribute, and resolve that we attend the funeral services in a body."

Those who were well acquainted with Mr. Whitney, will understand the earnestness, the evident sincerity and the tenderness expressed in these resolutions by his employees. He was one of the most just, one of the kindest and most sympathetic of men, and his life seemed to be devoted to the happiness and the welfare of other people. He was a great lover of art and had a very fine collection of pictures. Among his business associates he was universally respected and loved, and he was often called upon to decide disputed matters between persons who could not agree.

A communication from him which is published in another page will have a melancholy interest, from the fact that it was found among his papers after his death. His brother wrote that "it was written in the early stages of his last illness, and is sent without revision."

Mr. Whitney leaves a widow and one grandchild.

The directors of the Austrian State Railroad have prepared an "industrial map" of the system, showing in detail the extent of the various industries and even like industrial establishments in the district served by the state railroad system. This work is intended, not merely to give information, like our Census maps, but to be a basis for practical discussions and suggestions concerning the policy to be pursued with reference to rates.

There seems some reason for the claim that the Austrian government is more progressive in the attempt to develop business by reduced charges than the Austrian private companies have been. It has made great reductions in passenger fares, and—if a recent report of the Vienna Chamber of Commerce be true—without bad effects upon earnings; a sure sign that such reductions were needed. This report says: "The system of state management shows itself to be a well-planned work of industrial policy. In opening the way for a system of rates which shall meet long-standing wants of industry and trade, it is taking a great step in advance as far

as concerns the general interests of the community; and there is no good reason to believe that it will be attended by loss to the railroads themselves."

This may be overdrawn, for chambers of commerce are everywhere apt to view state management in a rose-colored light. But there can be no doubt that the Austrian government is in advance of its neighbors in seizing the American principle of making rates to develop industry, as distinct from those to accommodate existing industry. We have before us some interesting proposals made by the management at the last meeting of the State Railroad Council with reference to special rates for manufacturing establishments. (1) For all new investments, whether in founding new concerns, or in extending the buildings of old ones, the materials shall be carried by the railroads for the mere cost of carriage. (2) On request of any concern the state shall build a private branch at cost, and allow convenient times of payment. (3) For those concerns which are at a distance from the road, the time of free storage at stations shall be extended as far as the existing station accommodation will admit.

These and other similar measures may point to the adoption, on the part of Austria, of something like American principles in regard to rates. In many respects the condition of Austria is not unlike our own. They have their grain fields and their grangers. They have their petroleum problems and their meat problems. They have their Erie Canal in the shape of the Danube and their Grand Trunk Railway in the shape of the northern through route via Russia and Prussia. They have their through traffic via rail and steamship to foreign lands, and the bickerings between different cities which such traffic involves. They have their undeveloped natural resources and traditions favoring a protective policy which shall develop them.

The methods thus far tried, with reference to special reductions of rates, have been slow, and much less radical than ours, but far more systematic. A commission, a year ago, made a detailed and, in many respects, extremely good report to serve as the basis for future action in this matter. The future development cannot fail to be of great interest.

Wm. von Nördling, one of the most eminent of Austrian railroad engineers, brought up in the French Corps of Bridges and Highways, has recently published a study on the cost of railroad transportation, apropos of a proposition for constructing large canals to connect the Danube with the Oder and the Elbe. Nördling does not make the mistake commonly made in such calculations, and oftener in Europe than elsewhere, of calculating the average cost of transportation on the railroad, and assuming that to be the measure of its ability to compete with another route, but he aims chiefly to ascertain the addition to the cost which is caused by an addition to the traffic, which is their true measure of ability to compete, and the true method of determining whether it will be economical to provide an additional route (either canal or railroad) to accommodate additional traffic. For if there is an addition of 1,000,000 tons of traffic to be provided for, and an existing railroad can carry it with an addition of \$1,000,000 to its expenses, then any new route which will cost more than \$1,000,000 a year for interest and expenses will be a cause of loss to the community providing and using it.

Nördling, after calculating that the average cost per ton per mile on the Theiss Railroad of Austria in 1875 was 0.98 cent, exclusive of loading and unloading, finds that additional freight under ordinary conditions would have cost 0.457 cent; with cars full one way and returning empty, 0.392 cent; and full both ways, 0.286 cent per ton per mile; while back load for cars that otherwise would return empty would have added only 0.180 cent per ton per mile to the expenses. He calculates the cost similarly for several different railroads, and for the system of Austria-Hungary as a whole. One of the railroads, which is parallel with the proposed canals, he estimates to carry at an average expense of 0.749 cent per ton per mile, and to be able to carry additions in full car-loads in one direction at 0.332 cent per ton per mile without loss, which is at the rate of 16 cents per 100 lbs. from Chicago to New York, and not far from what additions to traffic are estimated to cost on our railroads of heavy traffic.

The New York, Chicago & St. Louis Railway has to subsist chiefly on through freight, which for some time has been a food with little nourishment in it, and now that west-bound rates have been reduced is worth little more to a railroad company than sawdust to a human organism. But even in the last quarter of 1884, before the reduction of west-bound rates, its net earnings lacked \$152,339 of meeting its fixed charges, while for the year 1884 the deficit was \$518,968, against a deficit of \$774,294 in 1883. It is, however, surprising that the road should do so well rather than that the deficit is so large, considering what rates have been, and how little traffic other than through freight, or freight carried at through rates, the road has. The working expenses, exclusive of taxes, were 70 per cent. of the earnings last year, and the expense per ton per mile must have been extremely low. Per mile of road the gross earnings were \$6,160 and the net \$1,867, against \$4,450 gross and \$1,120 net in 1883. The increase was certainly very large; but the gross earnings, as well as the net, are very light for a trunk line. The other new roads east of Chicago compare with it as follows:

	Gross.	Net.
N. Y., Chic. & St. L.	\$6,160	\$1,867
Balt. & Ohio, Chicago Division ..	7,553	1,804
Chic. & Grand Trunk	9,481	2,277
Chicago & Atlantic	5,390	294

Thus the Nickel Plate shows larger net earnings than the Baltimore & Ohio, which has been open more than ten years but which gets a much smaller proportion of the through

freight, including live stock, than the Nickel Plate). In both gross and net it is ahead of the Chicago & Atlantic, whose year dates to June 30, but is probably more rather than less favorable, so far as gross earnings are concerned, than the calendar year. The Chicago & Grand Trunk, which has been open about three years longer than these two, earned 54 per cent. more gross, but only 22 per cent. net, more than the Nickel Plate last year, having a much larger proportion of the through traffic.

Since 1884 the circumstances have been more unfavorable for this road, the east-bound rates remaining low and the west-bound having been reduced one-third. Fortunately for it, the Nickel Plate does not attempt to do a through passenger business, as at the rates that have been current for some time, the share it could obtain of this business could only add to its deficit.

Last week again there was an increase in the Chicago shipments eastward, which have been increasing steadily since they were interrupted by the blockades in the second and third weeks of February, but have not yet reached nearly to the shipments of the first week of February and the last week of January. For the week ending March 14, and corresponding weeks of previous years, they have been, in tons:

	1880.	1881.	1882.	1883.	1884.	1885.
Flour.....	67,413	52,968	47,967	69,696	47,135	66,675

The shipments this year do not include freight other than flour, grain and provisions, and are otherwise imperfect. As reported they were 41½ per cent. more than the completed reported shipments of last year, and nearly as great as those of 1880 and 1883. Last year the nominal rate was 30 cents, but was actually much less, and 20 cents was made the open rate March 14, and 15 cents March 21, followed by a great increase in shipments. The open rate was made 20 cents on Tuesday of last week, probably making very little difference in the actual rates paid for some time previous.

For six successive weeks the shipments and the percentage going by each railroad have been:

	Feb. 7.	Feb. 14.	Feb. 21.	Feb. 28.	Mar. 7.	Mar. 14.
Flour.....	19,219	11,282	8,908	15,549	17,153	20,600
Grain.....	52,131	30,913	22,887	30,913	36,354	38,989
Provisions...	10,025	3,846	8,044	6,706	7,474	7,086
Total	81,375	46,041	39,837	53,168	60,981	66,675
Per cent.:						
C. & Grand T.	7.0	6.4	2.0	6.0	10.2	0.2
Mich. Cen.	8.3	5.8	15.3	11.0	8.1	14.3
Lake Shore	29.4	26.0	19.7	18.7	17.0	17.1
Nickel Plate	3.3	7.4	7.1	8.2	5.1	7.2
Ft. Wayne	20.0	12.8	20.8	22.5	24.0	20.2
C., St. L. & P.	11.0	19.8	12.0	13.8	14.6	10.2
Balt. & Ohio	7.8	6.2	9.6	9.1	7.3	11.1
Ch. & Atlantic.....	13.2	15.6	14.1	10.7	13.7	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

The increase in total shipments last week over the previous week was 9 per cent. There was an increase of 7½ per cent. in grain and 20 per cent. in flour, but a decrease of 5 per cent. in provisions. The flour shipments were extraordinarily large—more than in the first week of February, when the grain shipments were a third greater.

There was a greater unevenness in the percentages than for many weeks, the chief changes from the previous week being large gains by the Michigan Central and Baltimore & Ohio, and considerable losses by the two Pennsylvania roads, the latter taking 30.4 per cent. of the whole, against 38.6 per cent. the week before, while the three Vanderbilt roads carried 38.6 per cent. against 30.2 the week before.

These percentages lack much of showing the percentages of the several roads in the pool, as the statement does not cover any of the freight that brings the highest rates, and the division is according to earnings; and the more valuable freight, such as butter, eggs, cheese, wool, etc., is distributed very differently from the grain, etc., some of the older roads carrying much the larger part of it. We believe it is true, however, that the Chicago & Grand Trunk is not now "over" in the freight pool, and that the Michigan Central's balance over has been greatly reduced since January.

The shipments now are much larger than were made at the same (20-cent) rate last year, but much less than were made then after the reduction, March 21, to 15 cents. Every effort should be made to prevent a further reduction now, as it would probably render the flour and grain business wholly unprofitable, as it was for three months after March 20 last year, and none of the railroads has any profits to spare.

The Cleveland, Columbus, Cincinnati & Indianapolis Railway fared last year like other western connections of the trunk lines that have reported, suffering a decrease of one-seventh in its gross and of nearly one-third in its net earnings. Both were smaller than in any other year since 1878, and the surplus over fixed charges was the smallest since 1877. Few railroads in the country suffer so much by low through rates, not simply because its through business is a very large proportion of the whole, but because its local rates are very largely governed by its through rates. Its average freight rate is usually lower than that of the trunk lines themselves, while its traffic is very much smaller. Last year its surplus over fixed charges was but \$1.96 per share, against \$4.43 in 1883.

Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the Railroad Gazette as follows:

Shelby Iron Co.—This company has completed a railroad from Columbia, Ala., to Shelby Iron Works, 6 miles. Gauge, 5 ft.

Sylvania & Rocky Ford.—Extended northeast to Sylvania, Ga., 13 miles.

Union of Chattanooga.—Completed by laying 4 miles of track in Chattanooga, Tenn.

This is a total of 23 miles, making 154 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been:

Miles.	Miles.
1885.....154	1878.....150
1884.....311	1877.....127
1883.....394	1876.....302
1882.....1,001	1875.....120
1881.....501	1874.....196
1880.....753	1873.....348
1879.....241	1872.....581

This statement covers main track only, second tracks and sidings not being included.

NEW PUBLICATIONS.

Transactions of the American Institute of Mining Engineers. Vol. XII., June, 1883, to Feb., 1884.

This thick volume of 768 pages, neatly printed and exceptionally well indexed, giving as it does the proceedings for only six months, is a splendid monument to the activity and usefulness of this society, which easily excels all others in this country in the amount of apparently valuable matter published, if not in its usefulness in other ways. There have not been wanting those who have criticised its liberal policy in admitting members (who now number about 1,500) and its itinerant character (declining as it does to have permanent headquarters anywhere, but contenting itself with holding three meetings per annum in various cities). But any society which can gather in and make accessible such a mass of professional information must be pronounced a success in the highest sense. Many of the papers, especially those dealing with metals, are of much interest to railroad men and civil engineers, especially those on "Cast-iron of unusual strength," "Elevating and conveying machinery," "Tamping drill holes with plaster of Paris" and "Improvements in methods of physical tests," and a further commendable peculiarity of the society is that their proceedings are open to purchase by any one wishing them at the very reasonable price of \$5 per volume.

Proceedings of the Second Annual Convention of the Roadmasters' Association of America, held at Indianapolis, Sept. 10, 1884.

The report of this meeting, which did not accomplish as much as might be desired, but which certainly held out the promise of a useful association, is a little late in appearing. The subjects which appear to have been discussed with any degree of fullness were ballasting, frogs and switches, foot-guards at frogs and switches, elevation of curves, guard-rails and proper weight of rails. It was unanimously resolved as the sense of the convention that rails between 65 to 70 lbs. per yard were the proper thing for present rolling stock. A local complaint was uttered by several members at the irregularity of wheel gauges, which were stated by one member to vary from 4 ft. 4½ in. to 4 ft. 5½ in. from inside to inside of flange. The Hart foot-guard for frogs (illustrated in the *Railroad Gazette* for May 9, 1884) was strongly commended by many members, although a resolution recommending it for use as preferable to any other foot-guard known or in use was lost.

The discussion on ballast and frogs and switches was especially valuable and practical, and contains much useful information.

The chief impediment to the future usefulness of the association, so far as can be judged from the proceedings, is the lack of a few members who feel a strong personal interest in its success, impelling them to give the necessary time and do the necessary hard work to "keep the ball a-rolling;" and it would seem as if their constitution had unnecessarily narrowed the basis of the association by stipulating that "only road-masters" should be members. By enlarging the basis of the association to include all engineers of maintenance of way who may choose to join, the usefulness and strength of the association would, we think, be enlarged.

The proceedings are published for the association by the Ajax Forge Co., of Chicago, from whom, we presume, copies can be obtained by interested applicants.

Tunneling under the Hudson River, being a description of the obstacles encountered, the experience gained, the success achieved and the plans finally adopted for the rapid and economical prosecution of the work. By S. D. V. Burr, A. M. New York, John Wiley & Sons.

This is a well-written, fully illustrated, and to an engineer, exceedingly interesting account of the checkered and much-discussed history of this now celebrated work. There is a general feeling that the work has been more or less a failure, both financially and mechanically, for which the delay in completing the structure is no doubt responsible; but the statement in the preface that daily averages of 3, 4 and 5 ft. per day were realized for longer or shorter periods, and that when the heading was 1,000 ft. from shore the daily average for 200 consecutive days were 3½ ft., or 667 ft. in all, shows that this assumed impression, if it in fact exists, is far too sweeping, as respects the engineering at least. Of the 5,700 ft. from air-lock to air-lock, 1,800 ft. had been completed when work was suspended in November, 1882, solely from lack of funds, the work having then been advancing, in the most satisfactory manner, at the rate of 4½ ft. per day for the last four weeks. The works were shortly afterward put in safe condition to allow them to fill with water, which is their present condition, everything (except the necessary funds) being in condition to resume work on a few days' notice.

To the engineer the history of the work as it now stands includes all that was likely to prove of most interest, since all apparent difficulties had been overcome and no new ones had developed for some time before suspension. The book will well repay study.

The New Orleans Exposition.

III.

Although the locomotives exhibited present few novel features, some description of their peculiarities may be interesting.

In our general review of the exposition* we omitted to mention a small logging engine, which runs on a rough and sharply curved track between the machinery annex and the saw-mill building. The engine is built on Douglas's patent, and has a vertical boiler and is carried on two four-wheeled trucks. The cylinders work crank-arms on an independent shaft which passes through the centre of the forward truck, and the crank-shaft and truck axles are coupled together by a single central rod having three bearings, the centre bearing brasses being spherical. The two trucks are both thus free to radiate in relation to the body of the engine, as in an ordinary eight-wheel car. An engine of this type is at work on the Central Wharf, Pensacola, and has been described in these pages. It is reported to be the smallest locomotive in the world doing useful work. The engine exhibited is somewhat larger and was built by the Bucyrus Foundry & Manufacturing Co., Bucyrus, Ohio.

The Rhode Island Locomotive Works, of Providence, R. I., exhibit two engines, one for the 5 ft. convertible to the standard gauge, and the other built for the 3 ft. gauge. Both engines are painted a dark maroon brown, while all other engines, except the Belgian engine, which is painted green (the usual color in Europe), are painted black. Even a very dark tint of warm brown is certainly more pleasing to the eye than a large black surface.

The wide-gauge engine has 16 in. x 24 in. cylinders, 62 in. drivers, and weighs 79,500 lbs. The weight on drivers is 51,200 lbs. The boiler shell is made of ¾ in. Otis steel, and measures 48 in. diameter at the smoke-box end. It has an extension front, and a wagon top on which is placed the dome. The sand-boxes are placed under the running board. The sides and top of the outside fire-box are all in one sheet, and all the longitudinal seams are double-riveted and provided with lap-welds with rivets alternating on both sides of the main seams to protect calking edges. The fire-box is 66 in. long, and the tubes are 150 in. number, 2 in. diameter and 11 ft. 4½ in. long. The water space is 3 in. wide at sides, and not less than 3½ in. back and front. The stay-bolts are ¾ in. diameter, and are placed at 4½ in. centres. The fire-door opening is formed by flanging and riveting together the inner and outer sheets.

The bearings and wearing surfaces are of good size for an engine with 16-in. cylinders, as will be seen from the following list: Eccentric-rod pins, 1½ in. diameter x 2½ in. in link; lifter-pin, 6 in. long; link saddle-pin, 4½ in. long; reverse-shaft bearings, 2½ in. diameter x 3½ in. long; rocker-box bearing, 12 in. long; eccentrics, 3-in. face, 15½ in. diameter. The main pins are 4 in. x 4 in., and the side-rod pins 4 in. x 3 in. The driving-axle journals are 7 in. diameter x 8 in. long.

All the steam cocks in the cab are attached to a suitable standard having one opening into the boiler. This opening is reinforced by a wrought-iron ring, and is provided with a self-closing valve inside the boiler, preventing any rush of steam should the standard be knocked off in an accident. The cylinders are oiled by a sight-feed lubricator placed in the cab. Two No. 7 injectors are used, one Friedman monitor and one Friedman non-lifting.

This engine has cast-iron slide-bars, with four-bar steel cross-heads of the usual pattern. The Eames vacuum brake is applied on both sides of each of the driving-wheels.

The engine for the 3 ft. gauge has 14 in. x 18 in. cylinders and 45 in. drivers. The total weight is 49,070 lbs. of which 33,570 lbs. is on the four drivers. This engine is similar in design and arrangement to the one previously described, though, of course, all the parts are smaller. The Allen-Richardson slide valve is used, and the slide-bars are hammered iron case-hardened, with a cast-iron four-bar cross-head.

The Rogers Locomotive Works, of Paterson, N. J., also send an American type locomotive suitable for the Southern, 5 ft. gauge. This engine has 17 in. x 24 in. cylinders and 5 ft. 7 in. wheels and weighs 80,000 lbs. Its weight thus barely exceeds that of the Rhode Island engine, which has 1 in. smaller cylinders and 5 in. smaller drivers. As there are several engines of the same type (American) and of similar size in the exposition, built by different makers, it is interesting to notice the difference in their weights. All these engines are, of course, more suitable to the light trains usual on Southern than to the heavier trains on Northern roads. The following table exhibits the weights of the medium-sized passenger engines exhibited.

Maker.	Road.	Cylinders.	Wheels.	Weight.
Baldwin.....	Jacksonville, Tampa and Key West.	16 x 24	66	76,000
"	Morgan's Louisiana & Texas.	16 x 24	62	71,000
Pittsburgh.....	Jacksonville, Tampa & Key West.	16 x 24	66	72,000
Rhode Island..	"	16 x 24	62	79,500
Rogers.....	"	17 x 24	67	80,000

The lightest of these engines, that built by the Baldwin Locomotive Works for Morgan's Louisiana & Texas, is used both for passenger and freight traffic, and a sister engine lately hauled a freight train of 105 cars. Particulars of this performance have been already given in the *Railroad Gazette*.

The Baldwin Locomotive Works contribute no less than four engines, a remarkably fine exhibit. Two of the engines are of the American type, and have been already referred to.

* *Railroad Gazette* for Feb. 20, 1885, page 122.

One of the remaining engines is a ten-wheeler for the Central Georgia. The cylinders are 18 in. diameter by 24 in. stroke, and the drivers are 56 in. diameter on tread. The weight in working order is 84,500 lbs. The other engine is a Mogul for the New Orleans & Northeastern, a newly-built road crossing Lake Pontchartrain on an immensely long trestle, which has excited much attention. This engine has 19 x 24-in. cylinders with 52½-in. drivers, and weighs 93,820 lbs.

The Roanoke Machine Works, of Roanoke, Va., send an even larger engine, a Consolidation, with 20-in. cylinders. As we intend to give illustrations and full description of this engine shortly, we defer any further notice for the present.

The Pittsburgh Locomotive Works exhibit two American type locomotives. The larger of these engines is very similar to some powerful passenger engines supplied by the same makers to the Vandalia Line. This engine has 18 in. x 24-in. cylinders, 68-in. diameter drivers, and weighs 92,000 lbs. This is the largest and heaviest four-coupled engine exhibited, and its fine appearance excites much attention. The dome and sand-box are plain, without moldings. A large steel two-bar cross-head is used with phosphor-bronze rubbing pieces. The cross-head end of the connecting rod is solid, the brasses being tightened by a key placed horizontally instead of vertically as usual. The slide-bars are steel, and so are most of the pins, straps, etc. The coupling-rods are of I-section.

Two No. 8 Friedman non-lifting injectors are placed in front of the main drivers underneath the running board. This is a favorable position for keeping the injectors cool and out of the way, but it involves a long steam pipe. In our own experience we have found it most convenient to attach non-lifting injectors to the steps, and take the feed-pipe up to the running board at once. Nothing need then be disturbed in taking the wheels out, the injector is immediately under the engineer's eye, and is most accessible for examination and cleaning.

This engine, like most in the Exposition, has an extension front. The glass water-gauge is illuminated by means of a neat, specially designed lamp. The truck is plain centre-bearing, with spoke wheels. The truck axles are of homogeneous steel, and the driving axles hammered iron.

The smaller engine has 16 x 24-in. cylinders, and has many of the recent improvements—I-section coupling rods, extension front, etc. This engine has a four-bar steel cross-head with phosphor-bronze rubbing pieces. This engine has a swing-beam truck. The boiler is fed by two Hancock inspirators placed in the cab.

The engine sent by the Rogers Locomotive & Machine Works has been already referred to. It is a neat and well finished engine, with 17 in. x 24-in. cylinders. The gauge is 5 ft., changeable to 4 ft. 8½ in. Richardson-Allen balanced slide valves are used. The boiler is fed by one No. 7 and one No. 9 Monitor injector. The boiler has 184 flues 2 in. diameter, and 11 ft. long. The engine exhibited is precisely similar to several recently built for the Western Railroad of Alabama.

The tender contains 2,350 gallons of water. The main frame is composed of four longitudinal sills of 6 in. channel iron, braced together diagonally by flat bars. The brake beams are also of iron, hung from the main frames.

Messrs. H. K. Porter & Co., of Pittsburgh, Pa., exhibit a four-coupled logging engine with two-wheeled truck placed under the rear end. The engine is designed to run on steel rails weighing 20 lbs. per yard, laid to a 3-ft. gauge. The tank is carried on the boiler. The general dimensions of the engine are as follows:

WEIGHT AND GENERAL DIMENSIONS.	
Total weight.....	22,000 lbs.
Total weight on driving wheels.....	18,000 lbs.
Total wheel base.....	12 ft. 4 in.
Distance between centre of front and back driving wheels.....	4 ft. 8 in.
Diameter of cylinders and stroke of piston.....	9 in. x 14 in.
Diameter of driving wheels, outside of tires.....	33 in.
Diameter of truck wheels.....	20 in.
Boiler.	
Inside diameter of smallest boiler ring.....	32 in.
Material of barrel of boiler.....	Homogeneous cast steel
Thickness of plates in barrel of boiler.....	5-16 in.
Material of tubes.....	Iron lap welded.
Number of tubes.....	66
Diameter of tubes, outside.....	1½ in.
Length of tubes, over tube plates.....	7 ft. 3 in.
Size of fire-box, inside, length by width at grate.....	36 in. x 19½ in.
Water space at bottom.....	2½ in.
Thickness of plates in sides, back end and crown of fire-box.....	¼ in.
Thickness of front and back tube-plates.....	¾ in., 11-32 in.
How is crown-plate stayed, with girder or screw stays.....	Girder.
Diameter and height of dome.....	21 in. x 25 in.
Kind of grate.....	Wood burning
Water capacity of tank (in gallons of 231 cubic inches).....	375 galls.
Length over all.....	20 ft. 0 in.
Width.....	6 ft. 0 in.
Height.....	9 ft. 0 in.

While this engine is primarily intended for logging purposes, it is also suitable for freight or passenger service on any small local road where first cost has to be reduced to a minimum, and consequently the rails are light. As many of the peculiar features of Messrs. H. K. Porter's practice have been already described† in these pages, we need not further refer to them here.

E. Shay, of Haring, Mich., exhibits a geared logging-engine, for use on roads having heavy grades. This engine is in steam daily, performing switching work on the Exposition tracks, and can thus be seen in practical work. Three nearly vertical cylinders are placed alongside the outer fire-box, and work downward on a longitudinal crank-shaft placed abreast of the ash-pan. This crank-shaft is carried by a frame attached rigidly to a channel iron sill running the whole length of the engine, and really forming the main frame. Each end of the crank-shaft is furnished with a universal ball-and-socket and sliding-joint, and is thus coupled to other longi-

† See *Railroad Gazette*, May 30, 1884, page 416; and Aug. 22, 1884, page 613.

tudinal shafts which carry bevel pinions, geared into bevel gear-wheels attached to the truck-wheels, which carry the whole machine. The engine is supported by two four-wheel diamond trucks, and so far resembles an ordinary eight-wheel car rather than a locomotive. The use of universal joints enables the shaft to allow the trucks to radiate, and still drive all the wheels. We understand that a considerable number of these engines is in use on different logging roads. The engine exhibited was built by the Lima Machine Works, of Lima, Ohio.

Among various exhibits of parts used in connection with locomotives may be mentioned the following:

The Chester Steel Castings Co., of Chester, Pa., shows at E 40, in the main building, wrenches, piston-heads, rockers, links, etc., bent and twisted to show the toughness of these parts when made of cast steel. Cross-heads and other important parts of locomotives and other machinery are also shown by this firm.

Hudson's locomotive bell-ringer is shown by the National Iron & Brass Works, Dubuque, Ia.

The Chicago Tire & Spring Works, of Chicago, Ill., exhibits a collection of tires and springs at D 58 in the main building.

A. French & Co., of Pittsburgh, Pa., exhibit a fine collection of various forms of railroad springs at AA 42 in the main building.

A large working model of a locomotive and tender is shown in the colored department, which is situated in the gallery of the building containing the government and states exhibits. The engine is of 1 1/4 in. gauge, with 2 1/2 in. x 3 in. cylinders, and was constructed by John Allen, a colored engineer residing at Little Rock, Ark. Though somewhat roughly finished, it is a very creditable piece of work, considering the small facilities possessed by the maker. He says that he performed all the work himself, forging the tires, shrinking them on, turning them, doing all the boiler work and making all the patterns. It occupied his spare time for five years. The model is only one of many signs to be seen throughout the South that the colored race are developing many skilled workmen.

The Kirkwood patent grate-bar for locomotives is shown at D 30 in the main building. The front and back part of the grate are moved by separate levers.

Shaffer & Budenberg, of Magdeburg, Germany, show a variety of their well-known pressure gauges at AA 17 in the main building.

The only foreign engine is exhibited by a Belgian firm, Ateliers de Tubize. It is a small engine, intended for working rapid-transit or suburban trains. The working parts are hidden by hinged iron flaps, and the whole engine is covered with an iron roof. The engine can be worked from either end, a sort of cab for the engineer being provided both at the fire-box and smoke-box ends. Each cab has a reversing lever and brake wheel. The engine is not, however, so completely boxed in as is usual in dummies made here. The same object, however, appears to be attained, the moving and bright parts, likely to frighten horses, being hidden. We regret that we are unable to give any figures as to the size and weight of this engine, the Belgian Commissioner informing us that he had no particulars. It would seem that engineers visiting the Exposition are either few in number, or are somewhat apathetic as to the construction of the engine, as the courteous official in charge informed us that we were the first to make any inquiry concerning the engine.

Inspection showed that the frames were outside the wheels and that the valve gear was of the Walschaert variety, which is much used in Belgium. The springs, valve gear, etc., are all thus very accessible for repairs and examination without going underneath the engine, but are so crowded together that it may well be doubted whether this plan is preferable to the arrangement usual here.

A comparison with an adjoining engine built by Messrs. H. K. Porter, of Pittsburgh, Pa., will satisfy most engineers on this point. Messrs. Porter's engine is a logging engine, but the parts might be easily hidden by hinged flaps, as in the Belgian engine, were it considered desirable to do so. The practical simplicity of the American engine is very noticeable, and though small, all the parts are thoroughly accessible.

Foreign Railroad Notes.

The management of the Western (State) Railroad of Austria in the year 1883 made extensive experiments in the way of reducing passenger fares. The result was that the total passenger traffic increased 25 per cent, and the gross passenger receipts 4 1/2 per cent. But this slight increase in receipts was more than balanced by the increased expense of handling so large a traffic. On the whole, the reductions paid on the suburban traffic, but involved a loss on the long distance traffic.

The Austrian engineers have had such gratifying success in the Arlberg that another first-class tunnel is likely to be intrusted to them. The proposed line is intended to form a direct connection between Central Germany and the Adriatic Sea. It will run almost due north and south, and is expected to give a great impulse to the port of Trieste, as it will save many of the goods destined for that port more than 125 miles of railroad haul.

The new passenger station of the Hungarian state railroads at Buda-Pesth has involved the use of 80 acres of ground, with 16 miles of track. The cost was about \$2,000,000. It is lighted by 70 arc and 644 incandescent lamps, aggregating over 50,000 candle power, and requiring steam engines of 300 horse power for their maintenance.

As a measure of relief to suffering industries the managers of the State Railroads of France last fall proposed to make

a rate of 2 1/2 centimes per metric ton (2,204 lbs.) per kilometre, for shipments in quantities as great as 200 tons at a time, for distances of as much as 120 kilometres, or paying for that weight and distance. This would give about \$115 for hauling 220 tons of 2,000 lbs. a distance of 74 1/2 miles, or 0.7 cent per ton per mile, which is more than the average rate has been sometimes on some of our railroads. The conditions were made because they would give the railroad a full train load.

The railroad tunnel under the Severn, to connect Bristol with South Wales, is making rapid progress. It is not unlikely that it will be completed next year. There are 3,000 men now engaged on the work. The tunnel itself will be nearly 4 1/2 miles in length, besides cuttings of a mile or more for the approach at either end. When completed the tunnel will not merely shorten the haul of the freight, but will be a great convenience to passengers; for the 16 ft. tide of the Severn has necessarily made the ferriage arrangements extremely awkward.

A native correspondent, enumerating the most pressing wants of Indian railroads, includes among his nine heads—

"5. *Goods Clerks* who are paid sufficient to keep them above penury, and are encouraged to hope, with some degree of certainty, that the English Board (what wood is these boards generally made of?) will not fill up the lower official posts with disappointed cousins and uncles.

"8. *Directors* who will seek the best interests of the shareholders as apart from family and other considerations.

"9. *Contractors* who will not scrape up the refuse stores of the English market, and send things to India which were removed from Noah's ark and such like olden arrangements."

A correspondent of the (Indian) *Railway Service Gazette* writing from Australia, notes the evil effects arising from the way in which the Victoria state railways were involved in politics. Political influence, he says, was felt both in the appointment of the railroad officials and in the treatment of shippers. Things had gone so far that the adoption of civil service promotion rules, like those now introduced in the United States, was insufficient to meet the evils. The railroads had to be taken out of politics by the appointment of a permanent board of management, with large salaries and large powers. The effect of this change has been good in every way, both upon the finances of the railroads and upon the service of the public.

A large union freight station is about to be constructed in Berlin, devoted entirely to the handling of goods under custom-house supervision. The arrivals by railroad of dutiable goods in transit amount to 60,000 tons annually, besides large quantities to be held in bond, and there are large shipments of manufactures for export under through bills of lading on which the government pays drawbacks. The old accommodations are quite insufficient. The new buildings and yards, in the northwest quarter of the city, will cover an area of nearly 200,000 square feet, and will have direct communication with the River Spree, as well as with the Junction Railroad.

A recent Board of Trade return shows the percentage of rolling stock fitted with automatic brakes on the railroad of the United Kingdom, at different times:

June 30—	Engines.	Carriages (passenger).
1878	13	19
1879	19	25
1880	27	36
1881	39	48
1882	51	61
1883	60	69
1884	67	76

About two-thirds of the automatic brakes included in the above table comply with the conditions laid down by the Board of Trade. Of these the numbers in use are as follows:

Engines.	Carriages.
Westinghouse	1,345
Sanders & Bolitho's vacuum	1,092
Smith's vacuum	6,500
Clark & Webb	388
Steel & McInnes	3

In the *Revue générale des chemins de fer*, Mr. Urbane Chief Engineer of the Great Central Railroad of Belgium, published a table to serve as a general rule for calculating the value of the rolling stock necessary to commence the working of railroads of a secondary importance, based upon the estimate of their probable receipts per kilometre per annum.

Below we give so much of the table as refers to roads of standard gauge, recalculated for American miles and dollars:

Estimated receipts per mile.	Value of locomotives per mile.	Value of cars per mile.
\$623	\$399	\$467
748	478	561
872	558	654
997	638	748
1,121	718	841
1,245	797	934
1,369	877	1,027
1,492	956	1,120

The scientific school at Stuttgart has arranged a "course of instruction preparatory for higher positions in the railroad, postal or telegraph service." It is a one year's course, and includes the following subjects:

Winter term—Political economy, finance, elementary law, railroad history and construction, history of post-office and telegraph.

Summer term—Advanced political economy, administrative law, public law, railroad engineering, railroad and telegraph service.

The courses on political economy and law must be attended by all. The railroad men are not required to at-

tend the telegraph courses, nor the telegraph men the railroad courses. There are optional courses in signaling and in general principles of applied mechanics.

The construction of railroads by the state in India appears to be attended by very heavy staff expenses, if we may judge from a series of articles by an engineer of the Public Works Department, the first of which has just appeared in the *Engineer*, arrainging the system as wasteful and inefficient. Under the organization of the Public Works Department the accounting and engineering staff are more or less united under one chief engineer, much as was the custom on the southerly portions of the recently constructed American lines in Mexico, the work being executed in part by small sub-contracts and in part by day's work. The following is given as an estimate of the staff for 200 miles of average work and its cost per month, which is stated to have been carefully framed to be well within the truth:

Accounting Staff.	Per mo.	Engineering Staff.	Per mo.
2 examiners of accounts	\$720	1 chief engineer (not stated)	
2 deputy do.	405	5 executive engineers	\$1,463
1 assistant do.	202	Office employees of do.	1,125
Office employees of do.	405	15 assistant engineers	2,700
10 accountants	1,125	Office employees of do.	225
5 cashiers	450	12 subordinate do.	648
1 chief storekeeper	225	12 native subordinates	216
Office employees of do.	270	Average traveling allowance	600
Average traveling allowance	300		
Total per mo. (200 miles)	\$4,102	Total per mo. (200 miles)	\$6,977

These totals are equivalent to \$246 per mile per year for the accounting department, and \$419 per mile per year for the engineering department. The total, it is stated, "takes no account of a lower subordinate establishment, police, bridge erectors, salaries of officers at a distance, temporary establishment, and many similar charges."

The existing status of the track of the German railroads at the close of the fiscal year 1881-2 was as follows, in miles:

	Steel.	Iron.	Total.
Vignoles or American T rail, on cross-ties	10,308.6	22,598.6	32,907.2
Chair rails, double headed English pattern, on cross-ties	137.7	643.9	781.6
On longitudinal sleepers	2,218.1	209.7	2,427.8
Resting directly on the ballast (Hartwich system)	25.7	25.7	51.4
Other systems	8.1	11.1	19.2
Total	12,762.5	23,489.0	36,251.5

About two-thirds of the track of the German Empire was therefore still of iron at the date of the report. This, however, includes sidings, the respective portions of which were as follows:

Main track	21,278.9 miles
Second track	6,280.8 "
Third track	23.9 "
Fourth track	2.1 "

Total main track 27,593.7
All other track, including length of leads to switches, 8,656.8

Total track mileage as above 36,251.5; all being of standard gauge and all laid with even joints.

The total mileage of iron or steel sleepers, or some equivalent of all kinds, is 4,030.6 miles. Leaving of main track on wooden cross-ties 23,563.1

Thus an iron superstructure was used instead of wood cross-ties on a mileage equal to more than one-seventh of the main track at this date.

At the close of 1881 there were only 3,606 miles of iron superstructure, 2,364 miles of which had longitudinal, and 1,242 miles transverse iron sleepers, 412 miles of which latter had been laid within the year against 380 miles of the former. It will be seen from the above that this tendency to prefer transverse to longitudinal supports still continues, only 64 miles of the latter having been laid since 1881, against 361 miles of transverse iron (or steel) ties. This, however, is largely, perhaps chiefly, due to the fact that the Prussian government prefers the longitudinal system, and more than half the mileage in the Empire is in its hands.

The civil service examinations for railroad officials of higher classes on the state railroads of Wurtemberg cover the following subjects.

Second-class positions (bookkeepers, clerks, or station masters of the second class): Constitution of Wurtemberg; elements of railroad law; ordinances concerning railroad signals, construction and service; elements of mercantile law, in so far as it immediately affects railroads; accounting, theoretical and practical; telegraphy; railroad history and geography; French (English and Italian are optional subjects).

The candidates must be 21 years of age, have had a high school education, and have been three years in the railroad service.

For first-class positions (inspectors, heads of offices or of first-class stations, higher positions in the general management) there is required a short second-class service and then a further examination on the following subjects: Political economy, elements of public, mercantile and criminal law, railroad technology, finance.

As fast as places become open, they are filled by the candidates who have passed these examinations successfully.

The London & Northwestern Railway has introduced electric lighting on its Liverpool & Manchester Division. Swan's incandescent lamps are used, connected in a return circuit with a Brotherhood's engine on the tender. This is worked by steam furnished from the locomotive; and the intensity of light is regulated by the engines. Each compartment is fitted with a duplicate lamp, with an automatic arrangement that if one goes out the other will be instantly lighted.

The great difficulty with this system is that if the engine is disconnected, the lights will go out. This difficulty is

avoided in the electric lighting of certain suburban (London) trains from Kensington to Putney. This is carried on by the Electric Light Company, under the supervision of W. H. Massey. A separate Willan engine (7 horse-power) and Siemens dynamo are attached to one of the carriages. This has been in operation since the beginning of the year, and is said to give satisfaction. It admits of a change of locomotive, but for long distance trains would have the great disadvantage that the cars could not be detached to go in different directions. As for expense, it is estimated that it furnishes double the illuminating power of gas (such as had been previously used on that section) at 30 per cent. less cost. But it is a matter of great difficulty to make these comparisons fairly.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atchison, Topeka & Santa Fe, annual meeting, at the office in Topeka, Kan., April 16.

Chicago & Alton, annual meeting, at the company's office, in Chicago, April 6, at 10 a. m. Transfer books close March 14.

Denver & Rio Grande, meeting of the consolidated bondholders for consultation with the trustees, at No. 21 Nassau street, New York, at 1 p. m., on April 16.

Morgan's Louisiana & Texas, annual meeting, in New Orleans, April 6.

New York Central & Hudson River, annual meeting, in Albany, N. Y., April 15.

Pennsylvania Railroad, annual election, at the company's office, in Philadelphia, March 24.

Peoria, Decatur & Evansville, annual meeting, in Peoria, Ill., March 28.

Union Pacific, annual meeting, at the office, in Boston, March 25.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Dubuque & Sioux City (leased to Illinois Central), 2 per cent., semi-annual, payable April 15. The dividend last October was 1½ and last April 2½ per cent. The company paid 6 per cent. in 1883.

New York, Lackawanna & Western (leased to Delaware, Lackawanna & Western), 1½ per cent., quarterly, payable April 1.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Southern Time Convention* will hold its spring meeting in New Orleans, Wednesday, March 25.

The *General Time Convention* will meet at the Lindell Hotel in St. Louis, on Wednesday, April 8.

The *Association of American Railroad Superintendents* will hold its half-yearly meeting in Richmond, Va., on Wednesday, April 15.

The *American Association of Train Dispatchers* will hold its annual convention in Denver, Col., on Wednesday, June 3.

The *Master Car-Builders' Association* will hold its annual convention at the Hygeia Hotel, Old Point Comfort (Fortress Monroe), Va., beginning on Tuesday, June 9.

The *Master Mechanics' Association* will hold its annual convention in Washington, beginning on Tuesday, June 16.

The *Car Accountants' Association* will hold its annual convention in Minneapolis, Minn., beginning on Tuesday, June 23.

The *General Baggage Agents' Association* will hold its half-yearly meeting in St. Paul, Minn., on Wednesday, July 15.

The *Master Car-Builders' Club* will hold regular meetings at its rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.

The *New England Railroad Club* will hold its regular meetings at its rooms in the Boston & Albany station, in Boston, on the evening of the fourth Wednesday in each month.

The *Western Railway Club* will hold regular meetings at its rooms, No. 102 Adams street, Chicago, on the third Wednesday in each month.

Foreclosure Sales.

The sale of the *Cleveland, Indiana & St. Louis* road under foreclosure was to have taken place March 10, but by consent of all parties has been postponed until April 10, in Indianapolis. The road, which was originally known as the Anderson, Lebanon & St. Louis, has been in charge of a receiver for several years. It extends from Anderson, Ind., to Noblesville, 18 miles, and the line has been graded as far as Montezuma, some 70 miles further. The bondholders are making arrangements to buy the road and to extend it as soon as they acquire possession.

American Train Dispatchers' Association.

Since November last 58 applications have been received from train dispatchers for membership in this Association, and it is believed that by the time of the annual convention in June there will be nearly 600 members. A large attendance at the convention is expected.

New England Railroad Club.

The annual meeting of this Club will be held at its rooms in the Boston & Albany passenger station in Boston, on Wednesday evening, March 25, at 7:30 o'clock.

The Treasurer will submit his report.

Officers for the ensuing year will be elected. A Committee, consisting of George Richards, O. Stewart and John Coghlan, was appointed, at the last meeting to present a list of officers at this time.

The question of Transportation by Water to the next Annual Convention of the M. C. B. Association, commencing June 9, 1885, at Fortress Monroe, Va., will be considered.

Live questions of railroad interest, for the consideration of the Club during the coming year, may be presented by any one at this meeting.

A large attendance is expected, as a free social intercourse will be a feature of the meeting, after the business is transacted. All interested are invited.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—Mr. David Lee has been appointed General Superintendent of the Main Stem and branches, in place of Wm. M. Clements, resigned, to date from April 1. Mr. Lee is now Master of Road of all lines east of the Ohio River.

Boston, Barre & Gardner.—Under the new agreement this road is under the management of General Superintendent Adams of the Fitchburg road. Mr. H. H. Marshall remains on the road as Division Superintendent and Traffic Manager.

Mr. Walter M. Anthony is Division Passenger Agent and Mr. A. L. Whipple Train Dispatcher.

Buffalo & Southwestern.—At the annual meeting in Buffalo, N. Y., March 12, the following directors were elected: James Adams, O. P. Ramsdell, Wilson S. Bissell, D. E. Bailey, George Talbot, Henry Martin, R. Kingman, W. H. H. Newman, H. G. Nolton, E. G. Spaulding, Jewett M. Richmond.

Charleston & Savannah.—At the recent annual meeting this company elected H. B. Plant President; Wm. H. Brawley, C. G. Memminger, B. F. Newcomer, A. F. Ravenel and W. T. Walters, directors.

Chicago, Freeport & St. Paul.—The directors of the company are: E. Baldwin, Cresco, Ia.; S. W. Hutchinson, H. J. Porter, John F. Smith, M. H. Wilcox, Wm. O. Wright, Freeport, Ill.; Roger N. Allen, Boston; Wm. P. Watson, F. A. White, New York.

Chicago & Northwestern.—Mr. H. C. Mahans is appointed Assistant Superintendent of the Middle Iowa Division.

Chicago, St. Louis & Pittsburgh.—At the annual meeting in Indianapolis, March 18, R. Biddle Roberts, of Chicago, and Alfred L. Dennis, of Newark, N. J., were re-elected directors for three years.

Civil Engineers' Club of Cleveland.—At the annual meeting in Cleveland, O., March 10, the old officers were re-elected as follows: President, J. F. Holloway; Vice-President, Charles Latimer; Corresponding Secretary, E. H. Jones; Recording Secretary, M. W. Kingsley; Assistant Recording Secretary, F. C. Bate; Member of the Board of Managers of the Association of Engineering Societies, M. E. Rawson; Treasurer, S. J. Baker.

Cleveland Southern.—The following officers have been elected for this new company: President, A. J. Brocket; Vice-President, J. B. Glenn; Secretary, Abner Slutz; Treasurer, D. B. Wicks; General Manager, George Hester. Office in Cleveland, Ohio.

Concord.—Mr. Wm. M. Parker, formerly with the Northern road, is appointed Agent of this road at Nashua.

Cooperstown & Susquehanna Valley.—At the annual meeting in Cooperstown, N. Y., recently, the following directors were chosen: George Bissell, E. S. Bundy, Charles R. Burch, James Bunyan, E. M. Harris, F. Hecox, H. M. Hooker, Thomas Johnston, J. W. Lamb, J. F. Reustle, J. F. Scott, D. E. Siver, L. Taylor. The board re-elected E. M. Harris President.

Eureka Springs.—At the annual meeting at Eureka Springs, March 10, the following directors were chosen: Powell Clayton, Eureka Springs, Ark.; B. Baer, Fort Smith, Ark.; E. W. Taylor, Jefferson, Tex.; Morgan Jones, Fort Water, Tex.; Wm. H. Stein, Neosho, Mo.; R. C. Kerens, C. H. Smith, St. Louis; N. Herman, New York. The board elected R. C. Kerens President; Powell Clayton, Vice-President and General Manager; B. Baer, Secretary; Logan H. Roots, Treasurer.

Gulf, Colorado & Santa Fe.—At the annual meeting in Galveston, Tex., March 3, the following directors were chosen: Leon Blum, W. S. Davis, J. H. Hutchings, Walter Gresham, H. Kemper, W. L. Moody, J. D. Rogers, H. Rosenberg, George Sealy, J. E. Wallis, R. S. Willis.

Illinois Central.—The board has re-elected James C. Clarke President; Stuyvesant Fish, Vice-President.

Indiana & Illinois Southern.—Mr. Charles H. Steel has been appointed Receiver of this road.

Indianapolis, Decatur & Springfield.—The officers of this road under the trustees will be: George Bender, Superintendent; John S. Lazarus, General Freight and Passenger Agent; H. B. Leeds, Master Mechanic; J. V. McNeal, Auditor.

The United States Circuit Court has appointed Mr. H. B. Hammond Receiver, pending proceedings in foreclosure. Mr. Hammond is President of the Company.

Kentucky Central.—At the recent annual meeting the following directors were chosen: John Echols, Louisville, Ky.; M. E. Ingalls, E. H. Pendleton, Cincinnati; George Bliss, Calvin S. Brice, C. P. Huntington, Samuel Thomas, New York.

Little Rock, Mississippi River & Texas.—Superintendent of Motive Power and Machinery Frank Hufsmith has appointed Mr. J. V. Marshall Division Master Mechanic in charge of the Arkansas City shops, in place of M. I. Brokaw, resigned.

Louisville, New Albany & Chicago.—The new board has elected Wm. Dowd President; John B. Carson, Vice-President; Wm. H. Harris, Secretary and Treasurer; Wm. Dulles, Jr., Assistant Secretary and Assistant Treasurer; John Jacob Astor, Robert Lenox Kennedy, Samuel Sloan, R. G. Rolston, Robert R. Hitt and Wm. Dowd, Executive Committee.

Mexican Central.—Mr. Charles C. Blodgett has been appointed Assistant to the General Manager, with office in Mexico.

Michigan Central.—Mr. J. P. Roach, late a conductor on the road, has been appointed Superintendent of dining car service.

Middle & Western States Freight Association.—This association has re-elected J. M. Osborn President, and has elected J. M. Orr Secretary, making him a permanent officer and establishing his office in Toledo, Ohio.

Minnesota & Northwestern.—Mr. Raymond Dupuy is appointed General Superintendent, and will have charge of the work of construction.

National Association, General Passenger & Ticket Agents.—In New Orleans, March 17, the following officers were chosen: President, C. A. Taylor; Vice-President, John N. Abbott; Secretary, A. J. Smith.

New York, Pennsylvania & Ohio.—At the recent meeting of the bondholders in London the following voting trustees were chosen for the ensuing year: For the first mortgage bondholders, Sir G. Balfour, Rev. J. Lockington Bates and H. C. Raikes; for the second mortgage bondholders, C. E. Lewis.

New York, West Shore & Buffalo.—Mr. J. P. Bradfield, Chief Train Dispatcher, is appointed Acting Superintendent of the Hudson River Division, in place of Mr. C. W. Bradley, promoted to be General Superintendent.

Northern (New Hampshire).—Mr. Alva W. Sulloway, of Franklin, N. H., has been chosen President in place of Henry C. Sherburne, resigned.

Ogdensburg & Lake Champlain.—Mr. James H. Gracie is appointed General Baggage Agent, with office at Ogdensburg, N. Y., in place of G. W. Brash, resigned.

Pittsburgh, Cincinnati & St. Louis.—At the annual meeting in Columbus, March 17, the following directors were chosen: D. S. Gray, Columbus, O.; George W. McCook,

Robert Sherrard, Jr., Steubenville, O.; J. N. McCullough, Thomas D. Messler, Wm. Thaw, Pittsburgh, Pa.; W. H. Barnes, J. N. DuBarry, John P. Green, H. H. Houston, Wistar Morris, George B. Roberts, J. P. Wetherill, Philadelphia.

Rome, Watertown & Ogdensburg.—General Manager H. M. Britton has issued the following circular: "Owing to the increased amount of work in the passenger and freight departments of this road, they have been separated from March 1. W. F. Parsons is hereby appointed General Passenger Agent, with office at Oswego, N. Y. Matters pertaining to this department should be addressed to him as above. E. M. Moore will continue as General Freight Agent and all matters pertaining to this department should be addressed to him."

Shelby Iron Co..—This company's office is at Shelby Iron Works, Ala.; the officers are: President, Newton Case; General Manager, J. A. McArthur; Superintendent, H. B. Stoughton.

Silver Springs, Ocala & Gulf.—The officers of this company are: President, Myron P. Walker, Boston; Secretary, Irving Davis, New York; Treasurer, Oscar Tamagno, New York; General Manager, W. T. Sylvester, Ocala, Fla.; Chief Engineer, N. R. Gruelle, Palatka, Fla.

South Florida.—At the annual meeting, March 11, the following directors were chosen: James E. Ingraham, Sanford, Fla.; W. S. Chisholm, H. S. Haines, Savannah, Ga.; B. F. Newcomer, Baltimore; E. B. Haskell, R. M. Pulsifer, Boston; H. B. Plant, New York. The board elected James E. Ingraham President; R. M. Pulsifer, Vice-President; F. H. Rand, Secretary; C. C. Haskell, Treasurer.

Texas & St. Louis.—Mr. John S. Corning has been appointed General Agent, with office in Chicago, and Mr. Harry White Eastern Agent, with office in Cincinnati.

Vancouver & Yakima.—This new company has its office at Vancouver, Wash. Ter.; the directors are Samuel W. Brown, George W. Durgin, Lowell M. Hidden, Orville A. Palmer and Eugene Semple.

Virginia Midland.—Mr. Robert Andrews has been appointed Superintendent and Engineer of this road in place of Mr. W. M. S. Dunn, who has gone to the Cape Fear & Yadin Valley road. Mr. Andrews has issued the following circular, dated Alexandria, Va., March 9:

"Mr. Charles T. Dabney is appointed Master of Transportation, with office at Alexandria. He will have the immediate charge of all conductors, baggagemen, brakemen, and other trainmen, yardmasters and switchmen on the line; and will have charge of the arrangement of trains, the distribution of cars, and the car mileage records. Agents will send all telegraphic car reports and orders for cars to him. His orders will be respected and obeyed accordingly."

"Mr. E. E. Dinwiddie, as Chief Train Dispatcher, will be charged with the responsibility of issuing telegraphic train orders for the prompt and safe movement of trains. He will also act as Supervisor of the telegraph lines, and all telegraph operators and line repair men will be subject to his directions."

"These appointments will take effect March 15; on and after which date agents will send all car reports and orders for cars to Mr. Dabney at Alexandria. Agents at Charlottesville, Lynchburg, Danville, Franklin Junction and Rocky Mount will have the immediate charge of the yard switchmen, and will have a supervision over conductors, baggagemen and brakemen, while remaining over at those stations."

Worcester Union Depot.—Mr. James Cunningham is appointed Depot-master at the Worcester, Mass., Union Depot.

PERSONAL.

—Mr. M. I. Brokaw has resigned his position as Master Mechanic in charge of the Arkansas City shops of the Little Rock, Mississippi River & Texas road.

—Mr. W. R. Woodard has tendered his resignation as Receiver of the Texas & St. Louis road, and will retire as soon as the Court relieves him and appoints his successor.

—Mr. C. B. Meeker, General Passenger Agent of the New York Central & Hudson River road, who has been for some time past sick at his home in Schenectady, N. Y., is now in a very critical condition and is not expected to recover.

—Mr. J. W. Smith has resigned his position as General Manager of the West Shore Fast Freight Line, and will retire April 1. Mr. Smith has had charge of the line since it was first established, about a year ago, and his management has been very successful.

—There are probably few men who have so wide an acquaintance or so many friends among railroad officers as the Eastern agent of the Dayton Manufacturing Co. His name is Geo. H. Carey, and his office has just been removed to No. 1 Broadway, New York, which is easily found because it is on the water end of Broadway.

—The trial of the suit of the Rutland Railroad Co. against John B. Page, for 17 years its President, began in Rutland, Vt., March 17. The present officers of the company claim that they can prove a great number of wrongful transactions running through nearly all the time of his connection with the company, while he claims that he has done no wrong, and that the company is indebted to him. The case is a very complicated one, and a great deal of testimony will have to be taken.

—Mr. Thomas J. Hamer died in Cincinnati, March 5, in the 54th year of his age. He was born in Taunton, Mass., and learned the machinist's trade in the locomotive shops in that city, afterward taking a course in mechanical engineering in New York. His first prominent position was as Master Mechanic of the Eastern Division of the Philadelphia & Erie road, where he remained a number of years, leaving that road to accept the position of Master of Machinery of the Chesapeake & Ohio, on which line he remained until 1875. He was then for a time Superintendent of the Ontario Southern, and left that road to become connected with the Toledo, Cincinnati & St. Louis. For some 18 months past he has been in poor health, but had just completed arrangements to enter into business in Cincinnati, handling a special line of railroad supplies. Although his health had not been good for some time, his death was sudden and unexpected. He was highly esteemed as an expert mechanic and a railroad man of judgment and experience, and leaves many friends.

TRAFFIC AND EARNINGS

Diversion of Freight at New York.

In the matter of the complaint of the Traders & Travelers' Union and others against the diversion of freight from one line to another at New York, in order to even up the proportions in the pool, the New York Railroad Commissioners have made a report in which they recommend as a matter of sound business policy and expediency, that the trunk lines, particularly such as are New York corporations, and the various fast freight lines controlled by them, shall hereafter omit from their bills of lading the clause which permits freight to

be diverted. They also recommend the omission of the clause requiring shippers, in case of loss, to have recourse to the road upon which it occurs. They add that the question of division of freight where it concerns through shipments to the West can best be settled through national legislation.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Two months ending Feb. 28:

	1885.	1884.	Inc. or Dec.	P. c.
Ala. Gt. South...	\$293,241	\$177,589	I.	\$25,652
Char. Col. & A.	161,587	148,307	I.	13,280
Cin., N. O. & T. P.	397,745	342,943	I.	54,802
Cleve., Ak. & C.	63,791	61,404	I.	2,387
Col. & Greenville.	142,654	128,570	I.	14,080
Denver & R. G.	786,921	731,257	I.	55,664
Denver & R. G.	121,000	53,090	D.	763
Des M. & Ft. D.	52,936	93,011	I.	7,130
Ev. & T. Haute.	100,141	53,548	D.	6,093
Ft. Worth & D.	47,053	96,304	I.	16,918
Georgia Pacific.	113,222	2,701,429	D.	295,530
Grand Trunk.	2,405,890	54,558	D.	14,027
G. B. W. & St. P.	40,531	930,085	I.	10,574
Illinois Central.	940,659	710,186	I.	75,255
Southern Div.	785,441	293,155	D.	58,055
Iowa lines.	295,160	411,517	D.	22,768
Ind. Bloom. & W.	388,749	368,611	I.	50,130
Kansas City, Ft. Scott & Gulf.	427,741	134,594	I.	167,278
Kan. City, Spr. & Mem.	301,872	39,683	D.	101
Marq., H. & Ont.	39,582	69,695	I.	7,025
Mill & Northern.	76,720	74,893	I.	42,806
N. O. & Nor'west.	117,099	438,377	D.	11,031
Norfolk & West.	427,326	1,21,324	D.	1,144
Peoria, Dec. & E.	120,180	600,644	I.	34,899
Rich. & Dan.	635,543	246,600	D.	58,158
St. L., A. & T. H.	188,442	132,403	D.	1,320
Main Line.	181,083	75,088	D.	3,639
Belleville Line.	72,049	856,435	I.	1,938
St. L., Ft. Scott & Wichita.	858,374	114,644	D.	30,223
St. P., M. & Man.	84,421	29,580	I.	10,118
Shenandoah Val.	39,700	87,607	D.	9,134
Tol., Ann Arbor & N. M.	78,473	29,928	I.	25,968
Vicksburg & Mer.	55,896	216,705	D.	12,736
Vicks. Shreve. & Pacific.	203,909	2,530,397	D.	122,785
Va. Midland.	2,413,612	64,293	I.	3,632
Wab., St. L. & P.	67,927	\$274,645	I.	\$149,119
Western N. C.		\$127,270		\$2

Month of January:

Canadian Pac.	\$423,764	\$127,270	I.	\$149,119
Net earnings.	84,706	1,449,785	I.	120,970
Central Pacific.	1,570,755	208,629	I.	314,387
Net earnings.	523,007	23,193	D.	3,025
Connotton Val.	20,168	1,585		
Net earnings.	1,645	12,196	I.	1,965
Dan. & Norwalk.	14,161	20,444	I.	1,273
Des M. & Ft. D.	25,211	7,171	D.	2,720
Net earnings.	14,450	317,988	D.	30,662
E. Ten. Va. & G.	287,326	118,845	I.	767
South Carolina.	119,612	1,531,694	I.	143,255
Union Pacific.	1,674,949	155,191	I.	331,201
Net earnings.	486,392			

Month of February:

Ala. Gt. South.	\$98,450	\$89,276	I.	\$9,174
Char. Col. & A.	81,093	82,931	I.	1,838
Cin., N. O. & T. P.	196,098	160,134	I.	35,964
Cleve., Ak. & C.	32,000	29,842	I.	2,158
Col. & Greenville.	70,311	71,928	I.	1,617
Denver & R. G.	390,520	331,371	I.	63,149
Denver & R. G.	58,985	27,215	I.	510
Des M. & Ft. D.	27,725	48,846	D.	1,706
Ev. & T. Haute.	47,140	27,014	D.	2,679
Ft. Worth & D.	24,335	50,252	I.	2,442
Georgia Pacific.	52,694	1,297,147	D.	297,799
Grand Trunk.	999,348	24,449	D.	5,378
G. B. W. & St. P.	19,071	441,554	I.	10,605
Illinois Central.	452,159	372,145	I.	16,596
Southern Div.	388,741	131,643	D.	30,843
Iowa lines.	100,800	212,832	D.	22,119
Ind. Bloom. & W.	190,713	175,724	I.	38,027
Kansas City, Ft. Scott & Gulf.	213,751	63,396	I.	89,547
Kan. City, Spr. & Mem.	152,043	77,808	I.	10,523
Lake Erie & W.	88,331	20,045	I.	3,868
Marq., H. & Ont.	23,911	34,535	I.	3,115
Mill & Northern.	37,650	39,155	I.	23,825
N. O. & Nor'west.	62,980	225,357	D.	28,381
Norfolk & West.	196,976	56,592	D.	683
Peoria, Dec. & E.	55,909	333,755	D.	23,865
Rich. & Dan.	309,890	132,157	D.	38,757
St. L., A. & T. H.	93,400	66,878	I.	7,066
Main Line.	73,064	40,783	D.	1,949
Belleville Line.	39,834	407,128	D.	14,880
St. L., Ft. Scott & Wichita.	392,248	58,390	D.	20,190
St. P., M. & Man.	38,200	13,822	I.	1,828
Shenandoah Val.	15,650	44,284	D.	8,091
Tol., Ann Arbor & N. M.	36,193	17,445	I.	8,550
Vicksburg & Mer.	25,995	109,590	D.	11,685
Vicks. Shreve. & Pacific.	97,905	1,285,314	D.	181,268
Va. Midland.	1,104,048	35,083	D.	2,067
Wab., St. L. & P.	33,016			
Western N. C.				

First week in March:

Bur. C. R. & No.	\$66,374	\$46,705	I.	\$19,669
Canadian Pacific.	106,000	54,000	I.	52,000
Ches. & Ohio.	62,323	66,682	D.	4,359
Chi. & Alton.	168,397	161,619	I.	6,778
Chi. & East. Ill.	36,224	27,359	I.	8,874
Chi. Mil. & St. P.	430,000	346,435	I.	83,565
Chi. & Nor'west.	426,164	372,876	I.	53,288
Chi., St. P., Min. & Omaha.	89,500	82,300	I.	7,200
Cin., Ind., St. L. & Chi.	51,927	46,319	I.	5,608
Illinois Central.	233,500	204,430	I.	29,070
Iowa lines.	36,017	34,196	I.	1,821
Louis. & Nashv.	294,945	294,590	I.	30,355
Mill & No.	9,958	9,170	I.	788
Norfolk & West.	47,633	46,569	I.	1,064
Roch. & Pitts.	25,528	18,273	I.	7,255
St. L. & San Fran.	80,863	89,946	D.	9,083

Second week in March:

Canadian Pac.	\$91,000	\$46,000	I.	\$45,000
Chi. Mil. & St. P.	461,000	396,044	I.	94,356
Denver & R. G.	98,259	80,432	I.	17,827
Long Island.	40,210	39,090	I.	1,120
Mill, L. S. & W.	25,835	21,880	I.	3,955
St. L. & San F.	83,900	93,500	D.	9,600

* Deficit.

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Southern Freight Rates.

The cut on Chattanooga rates made by the steamships and the Georgia Associated lines has been met by the Cincinnati, New Orleans & Texas Pacific. The first-class rate from New York has been cut from \$1.40 to 40 cents, and an open war has begun.

Coal.

Coal tonnages for the week ending March 7 are reported as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Anthracite.	554,137	400,854	I.	153,283
Eastern bituminous.	181,897	151,615	I.	30,282
Coke.	48,370	51,109	D.	2,739

Anthracite tonnage is larger than for some weeks past. The allotment for March is 1,800,000 tons, which would give an average of about 400,000 tons a week, so that some restriction will be necessary in the later weeks of the month. The continued cold weather has caused some increase in demand, which cannot, however, last much longer.

Pennsylvania Railroad coal tonnages for the week ending March 7 was:

	Coal.	Coke.	Total.	1884.
Line of road.	158,923	47,885	206,808	171,084
From other lines.	60,339	485	60,844	56,644

Total.

Year to March 7.

219,262 48,370 267,632 227,728

1,774,822 418,446 2,193,268 2,284,905

Increase for the week, 39,904 tons, or 17.5 per cent.; decrease for the year, 91,637 tons, or 4.0 per cent.

Cumberland coal shipments for the week ending March 14 were 45,971 tons. Total to March 14 this year 352,833; last year, 344,326; increase, 8,507 tons, or 2.5 per cent.

Transcontinental Association.

The Central Pacific persists in its refusal to receive freight under the new tariff unless it is paid its full proportion under the old rates. The Union Pacific will, it is said, send all through freight by way of the Oregon Short Line and Portland for the present.

A meeting of the Association is held in Denver, March 20, at which an effort will be made to arrange differences.

The Union Pacific has notified the Pacific Mail Steamship Co. of its intention to terminate the contract under which that company receives a subsidy for maintaining rates. The Pacific Mail Co. claims that the contract was made by the Union and Central Pacific jointly, and can be terminated only by joint action of those companies.

Passenger Rates.

A meeting of the passenger agents of the east-bound lines was held in Chicago, March 16, all the roads being represented except the Baltimore & Ohio. After considerable discussion, a new schedule of rates was agreed upon, to take effect at once, provided the Baltimore & Ohio consents, and it is thought that that road will make no objection. The rate from Chicago to New York under this agreement is to be \$18.50 first class and \$15.50 second class; to Boston, via Suspension Bridge, \$20.50 and \$17.50; to Boston, via Montreal, \$18.50 and \$16.50; to Philadelphia, \$18 and \$15; to Baltimore and Washington, \$17.50 and \$15.

The cutting of passenger rates in Cincinnati was temporarily stopped March 13, the lines, including the Chesapeake & Ohio, agreed to maintain rates to Washington at \$10, which is still \$4 below the tariff rates. No agreement was made as to the New York business, for which there is still a great deal of cutting.

Pacific Coast Wheat Exports.

San Francisco exports for February were 130,058 barrels of flour and 2,978,072 bushels of wheat. For the eight months of the crop year, from July 1 to Feb. 28, they were 869,476 barrels of flour and 21,029,460 bushels of wheat. For the corresponding period for five years the total exports (reducing flour to wheat) have been, in bushels:

1880-81.	1881-82.	1882-83.	1883-84.	1884-85.
17,259,000	29,550,833	23,927,000	18,883,833	25,376,833

Oregon exports in February were 30,057 barrels of flour and 615,720 bushels of wheat.

Passenger Notes.

The Baltimore & Ohio and the Shenandoah Valley companies have made an agreement for the exchange of passenger business, and for a through passenger line between Baltimore and New Orleans. The through line will be under the management of the Shenandoah Valley road; the Baltimore and Ohio road hauling the trains from Shenandoah Junction to Baltimore and Washington. Under this agreement a through Washington-New Orleans express began running March 16.

Joint Executive Committee.

Announcement has been made that the Vandalia Line has given notice of its withdrawal from the east-bound pool from St. Louis. This withdrawal will practically complete the dissolution of the present arrangements at the three chief pooling points: the Grand Trunk having withdrawn from the Chicago pool, the Vandalia Line from the St. Louis pool, and the Cincinnati, Indianapolis, St. Louis & Chicago from the Indianapolis pool.

Cotton.

Cotton movement for the week ending March 13 was as follows, in bales:

	1885.	1884.	Inc. or Dec.	P. c.
Interior markets.	21,580	46,943	D.	25,563
Receipts.	39,427	68,006	D.	28,579
Shipments.	181,132	184,414	D.	3,282

Stock, March 13.

Receipts.

Exports.

Stock, March 13.

736,103 849,472 D. 104,369 12.4

The total movement from plantations for the cotton year (from Sept. 1) to March 13 was 5,385,180 bales, against 5,272,250 in 1883-84, 6,144,965 in 1882-83, and 4,922,012 bales in 1881-82.

RAILROAD LAW.

The Law of Fellow Servants.

An important case was appealed March 12 from the Supreme Court of Kansas to the Supreme Court of the United States, on a question of constitutionality regarding certain laws enacted by the Kansas Legislature of 1874. In 1883, an engineer of the Missouri Pacific road sued the company for damages sustained in a wreck, he having lost a leg.

The case was tried in the District Court of Atchison County, July 3, 1883, and plaintiff secured a judgment for \$11,000. But the Court granted defendant's motion for a new trial, and the case was gone over with again in June, 1884. This time, the judgment was placed at \$12,000. The case was appealed by defendant to the Supreme Court, and that body sustained the judgment. Now it has been appealed to the Supreme Court of the United States, to test the constitutionality of the law enacted in 1874, which allows an employee to recover against a railroad company for the negligence of a co-employed. This is the largest judgment ever affirmed against a railroad in the state of Kansas.

Nebraska Railroad Law.

The Lincoln (Neb.) State Journal gives the following summary of the railroad laws passed by the Legislature of that State:

PASSENGER RATES.

S. F. 14 regulates railroad corporations in the transporta-

tion of passengers and baggage and fixes maximum rates of charges.

Sec. 1 provides that no railroad east of the 101st meridian in Nebraska shall charge for any passenger with baggage not exceeding 150 pounds more than the following rates:

Class A, roads earning \$4,000 a mile or more per annum, 3 cents per mile.

Class B, roads earning less than \$4,000 per mile per annum, 3½ cents per mile.

Roads west of the 101st meridian shall not charge more than 4 cents a mile.

The gross earnings are to be the earnings per mile from all sources, including branches, extensions and leased lines.

Sec. 2 provides that no railroad corporation shall charge more than half fare for any child under 10 years of age.

Sec. 3 permits the issuing of drawback checks for a sum not exceeding 25 cents.

Sec. 4 makes it unlawful to eject any passenger who tenders his fare and behaves properly.

Sec. 5 provides for the violation of any of the provisions of the act, a penalty of not less than \$200 nor more than \$1,000, to go to the school fund in the county where imposed, and makes the company liable to the injured person for all damages.

Sec. 6 defines railroad corporations and provides that the act shall apply to all associations of persons, incorporated or otherwise doing business on railroads (except street railways), as common carriers.

RAILROAD COMMISSION.

S. F. 187 provides for a board of railroad commissioners, defines their duties and provides for their salaries.

Sec. 1 provides that the Attorney-General, Secretary of State and Auditor of Public Accounts shall constitute a board of commissioners, each of whom shall have a secretary, who shall draw a salary of \$2,000 a year. The three secretaries shall be appointed, one from each congressional district.

Sec. 2 provides that the commissioners shall have supervision of all roads operated by steam in the state, shall inquire into any neglect or violation of the laws on the part of the roads, and shall examine and inspect the condition of the roads from time to time with reference to the security and convenience of the public and to see whether they neglect in any way to comply with their charter. They shall notify the roads of any needed change in writing, through any station agent, treasurer, superintendent or director. A report of such proceedings shall be included in the commissioners' annual report to the Governor, and by him transmitted to the Legislature.

Sec. 3 provides that the commissioners shall make a report each year showing as fully as possible the actual workings of the system of railroad transportation in the state and its relations to the general business of the state, and containing such suggestions as may to them seem appropriate. This section also provides that the report shall contain as to every corporation 19 specified items, such as amount of capital stock, funded debt, cost and cash value of the road, amount of its land, gross earnings, expense of running freight trains, passenger trains, etc., with such other statistics as the commissioners may think necessary and proper.

Sec. 4 provides that the board shall enter upon its duties within 10 days after the act becomes a law, and shall inform itself, by the most thorough investigation and closest application, respecting the business of the railroads and their profits and losses. The section provides each railroad shall, on or before Sept. 1, each year transmit to the board a statement under oath containing a list of 35 specified items similar to those in section 3, but covering more ground and tending to show the cost, value, condition, operating expenses, management as to the convenience of the public, and profits.

Sec. 7 provides that no person in the employ of any railroad company or holding stock in any such corporation shall be employed as secretary.

money, and every dollar realized by the sale will be applied to the completion of the road and its equipment, thereby enhancing the security. This will also advance the stock, as the government will have no preference. The line from Winnipeg round Lake Superior to this city will be finished in three weeks, and opened shortly after."

Cape Fear & Yadkin Valley.—An engineering party under Assistant Engineer Roger P. Atkinson is to be sent out to locate the line of the extension from Dalton to Mt. Airy, N. C. A force of convicts will at once be put on that portion of the line in Surry County to complete the grading.

Central Branch, Union Pacific.—Surveys have been begun for an extension of this road from its present terminus, westward to an extension with the Kansas Pacific at or near Monument Station. Two lines will be run, one starting from Bull and one from Lenora.

Central, of New Jersey.—The directors of this company have notified the Philadelphia & Reading Co. that they will not accept the purchase of the April coupons as payment, but that payment of the interest must be made in cash. It is said that the Reading people had made arrangements for the purchase of the coupons; but they are yet prepared for the payment of the money, having secured the promise of the amount needed on the pledge of the coupons, which will not now be permitted.

A meeting of the board was held March 18, at which a proposition was presented from the Reading to pass dividends altogether this year and to pay 2 per cent. next year, and gradually to increase the rate until the full 6 per cent. is reached. This was promptly rejected, and it was decided to take steps to revive the receivership and break the lease unless satisfactory assurances are received this week that the April coupons and the overdue taxes will be paid.

Central Pacific.—The statement for the month of January is as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings.....	\$1,570,755	\$1,449,785	I. \$120,970	8.3
Expenses.....	1,047,748	1,241,165	D. 193,417	15.6
Net earnings.....	\$523,007	\$208,620	I. \$314,387	150.7
Per cent. of exp's.....	66.7	85.6	D. 18.9	...

This company has always included rentals paid in expenses, but not taxes and general expenses. The earnings show an increase for the first time in nearly a year.

Chicago, Burlington & Kansas City.—Contracts have been let for the extension of this road from its present terminus at Bogard, Mo., southward to Carrollton, a distance of 8 miles. The work is to be completed by July.

Chicago, St. Louis & Pittsburgh.—The report for 1884 presented at the annual meeting this week shows the gross earnings, \$4,396,940; expenses, \$3,602,212; net earnings, \$794,728; receipts from other sources, \$80,945; total net revenue, \$874,673; interest paid on bonds, \$980,872; interest on car trust, etc., \$119,953; total charges, \$1,100,825; net loss, \$226,152.

Extensive improvements have been made to property, \$1,213,335 having been expended in this direction, and charged to the capital account; mainly for real estate in Chicago and new shops at Indianapolis.

Cleveland, Columbus, Cincinnati & Indianapolis.—The following preliminary statement is made for the year ending Dec. 31:

	1884.	1884.	Inc. or Dec.	P. c.
Earnings.....	\$3,811,742	\$4,342,604	I. \$530,862	13.9
Expenses.....	2,756,748	3,018,383	D. 261,635	8.7
Net earnings.....	\$1,054,994	\$1,324,221	I. \$269,227	25.5
Charges.....	781,777	659,487	I. 122,290	18.5

Surplus.....\$293,217 \$664,734 D. \$371,517 55.9
Charges include interest and taxes. The surplus last year was 1.95 per cent. on the stock. The expenses were 72.3 per cent. of gross earnings, against 69.5 per cent. in the preceding year.

Connotton Valley.—The Boston Advertiser of March 17 says: "The foreclosure sale of the Connotton Valley Railway will take place about May 1. More than 94 per cent. of the security holders have signed the plan of reorganization and deposited their securities. Nearly as many of the stockholders have also joined in the plan. All those who have not made their deposits should do so before May 1, so as to enable them to get the full benefits of the reorganization."

Cumberland Valley.—Some time since proceedings were begun by a bondholder to foreclose the mortgage on the Southern Pennsylvania Railroad, which the Cumberland Valley Co. operates under lease, owning also the controlling interest in the stock. These proceedings have now been closed by the Cumberland Valley purchasing the bonds, thus becoming absolute owner of the road. The Southern Pennsylvania extends from near Chambersburg, Pa., to Richmond, 21½ miles, with a branch 2 miles long to Mercersburg.

Dayton & Ironton.—Preparations are being made to change this road, formerly a division of the Toledo, Cincinnati & St. Louis, from 3 ft. to standard gauge. It is understood that the bondholders, who are now the owners of the road, are prepared to spend all the money necessary to make the change and to put the road in good condition for business.

Dubuque & Sioux City.—The financial statement of this company (whose road is leased to the Illinois Central) for the year 1884 is as follows:

Rental received.....	\$292,373
Other income.....	31,638
Total.....	\$324,011
Interest and expenses.....	\$62,666
Dividends, 4 per cent.....	199,976
Surplus.....	\$61,369
Surplus, Jan. 1, 1884.....	95,311

Surplus, Dec. 31, 1884.....\$156,680
In 1883 the total income was \$360,914, and 6 per cent. dividends were paid. The rental is 86 per cent. of gross earnings.

East Tennessee, Virginia & Georgia.—Arrangements have been made by this company to pay off the East Tennessee & Georgia bonds which matured Jan. 1 last. These bonds, of which \$217,000 are outstanding, will be paid through Maitland, Phelps & Co., of New York, on April 1 next, with interest to that date.

Formal notice has been served on this company by the officers of the Memphis & Charleston to the effect that that company considers the lease of its road as void, and will take steps to have it set aside.

Nearly all the engineers on the Macon & Brunswick Division of the road struck last week, claiming that they had been unfairly treated by the company and had been required to do more work than their agreement with the company calls for. The strike, however, lasted but a few days, Mr. P. M. Arthur, the Grand Chief Engineer of the Brotherhood of Locomotive Engineers, having arranged matters amicably in

a conference with the Superintendent. Mr. Arthur had been telegraphed for at the time of the strike.

Gaston.—This is a short coal road running from the Baltimore & Ohio near Fairmount, W. Va., to the coal mines at Gaston. Work has just been begun on an extension from that place to South Gaston, 5 miles, which will open up a tract which is known to contain gas coal of excellent quality.

Grand Trunk.—This company's statement for the month of January is as follows:

	1885.	1884.	Increase.	P. c.
Earnings.....	\$253,578	\$252,988	\$590	0.2
Expenses.....	206,183	205,687	496	0.2
Net earnings.....	\$47,395	\$47,301	\$94	0.2
Per cent. of exp's.....	81.3	81.3	.....	.....

The statement for the controlled lines west of Detroit is as follows:

	—Chl. & Gd. Trunk.—	—Det., G. H. & Mil.—
Earnings.....	1885. 1884. 1885. 1884.	
Expenses.....	\$49,491 \$48,009 \$18,517 \$16,082	
Net earnings.....	42,239 37,938 16,052 15,512	
Per cent. of exp's.....	87.2 88.2 86.8 96.9	

The Chicago & Grand Trunk gained for the month \$6,392, or 14.9 per cent. in gross and \$2,091, or 41.8 per cent., in net earnings. The Detroit, Grand Haven & Milwaukee increased its gross earnings \$2,435, or 15.2 per cent., while the gain in net earnings was \$1,895, or 332.5 per cent.

Great American & European Short Line.—An Ottawa dispatch says that the Dominion government has considered an offer of Norvin Green of New York to pay within 10 days \$150,000 arrears due workmen on the Great American & European Short Line road-bed, provided the government will renew the contract declared forfeited some time ago, and has accepted Green's proposition. This road, now more than half finished, is a short line from Oxford, on the Intercolonial Railway, along the shores of the Straits of Northumberland to New Glasgow, the centre of Nova Scotia's coal and iron fields. There it connects with the Eastern Extension running to the Straits of Canso. Thence the company is to build through Cape Breton to the port of Louisbourg. The company are to get a subsidy from the Dominion government of \$3,200 a mile, and the fee simple of the Eastern Extension Railway. The idea is to utilize Louisbourg, the nearest port to Europe for Atlantic passenger and mail service.

Houston & Texas Central.—The Court has authorized the Receivers to issue \$150,000 in certificates bearing 8 per cent. interest, having nine months to run, in order to meet necessary expenses on the road.

Illinois Central.—An official statement from this company says: "The books of the company show that there are 2,638 stockholders. Of these, 43,445 shares are registered in the name of a syndicate in Amsterdam, which for more than 20 years has represented a large but unknown number of small proprietors in Holland. The remaining 2,637 stockholders hold 246,555 shares, making the average holding of each less than 94 shares. Of the entire number of stockholders, including the Amsterdam syndicate, four own 5,000 shares each or over, 24 own 1,000 shares or over, 47 own 500 or over, 658 own 100 shares or over and 1,905 own less than 100 shares apiece. The number of shareholders last year was 2,218, and the 400 new ones are chiefly small investors in the New England states and in rural New York. The prevalent opinion that the Illinois Central stock is owned entirely in England and Holland is a mistake. Over one-third of the stock is owned in this country, which is more than twice the amount owned in Holland. Over 40 per cent. of the stockholders live in America."

Indiana, Bloomington & Western.—The reported intention of this company to surrender the lease of the Indianapolis, Decatur & Springfield road is confirmed, and arrangements are now being made for the transfer of that road to the trustees of the second-mortgage bondholders, who will take possession. It is understood that the road will be worked entirely for the local business, no attempt being made to secure through connection.

It was understood some time ago that this company had given up all intention of extending the Springfield road to St. Louis, although it was in the expectation of doing so that the road was leased. The company, however, has not given up its intention of reaching St. Louis, and it is said that the present plan is to buy the Western Division of the Toledo, Cincinnati & St. Louis road and to change it to standard gauge.

Indiana & Illinois Southern.—On application of the creditors of this company, the Court has appointed a receiver for this road, naming Mr. Charles H. Steel for that position. The Court has authorized him to issue \$100,000 in certificates for the purpose of paying off pressing claims and putting the road in good condition. It is a narrow-gauge line, extending from Effingham, Ill., eastward to Switz City, Ind., 89 miles. Its earnings have been very light, and since last fall only a part of the road has been operated, the business not being sufficient for the running of trains over the rest.

Indianapolis, Decatur & Springfield.—The action taken for the surrender of the lease of this road by the Indiana, Bloomington & Western Co. is noted elsewhere. In Indianapolis, March 16, counsel for the second-mortgage bondholders made application to the United States Circuit Court for the appointment of a receiver, the first-mortgage bondholders also joining in the application. The suit is brought to secure a sale of the road and a reorganization of the company, the bondholders of both classes having already united in the appointment of a committee to conduct the foreclosure proceedings and to reorganize a new company. The court granted the application for a receiver, and appointed Mr. H. B. Hammond Receiver of the road. It is understood that there will be no delay in the proceedings, but that the sale of the road will be had as soon as possible.

Little Rock & Fort Smith.—An advance statement of operations for last year is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Gross earnings.....	\$589,071	\$573,491	I. \$15,580	2.9
Expenses.....	343,489	335,200	I. 8,289	2.5
Net earnings.....	\$245,582	\$238,291	I. \$7,291	3.1
Charges.....	225,000	220,414	I. 4,586	2.1
Surplus.....	\$20,582	\$17,877	I. \$2,705	15.1

There were sold last year 28,094 acres of land for \$99,000; cash receipts on land account were \$126,747, and there were \$78,000 bonds canceled from land receipts. There were \$503,586 land notes on hand Dec. 31.

The total charges were increased last year by reason of the increase in the coupon scrip in 1883. The capital stock and debt remains as at the close of 1883, save the cancellation of 78 bonds, as noted above. Thus far in 1885 \$3,500 bonds have been canceled, and the trustees have \$18,000 in hand, to be used for bond cancellations.

Memphis & Charleston.—This company has served formal notice on the East Tennessee, Virginia & Georgia Co., demanding a surrender of the lease of its road. It is claimed that the lease was invalid from the beginning, and that the

East Tennessee Co. has not complied with its provisions, so that it is now void, even if it were originally legal.

Mexican Railroad Notes.—The following notes are from the Mexican Financier of March 7:

Construction has been commenced on the projected railroad from Mazatlan to Rosario.

In December, 1884, the grading done on the railroad from Merida to Peto amounted to 1,518 meters and the excavations to 487.45 meters. An average of 262 laborers was employed.

The Mexican National Railroad Co. will recommence construction within a few days, building from Morelia to Patzcuaro, a distance of about 30 miles. Patzcuaro is the key to the richest agricultural region in the state of Michoacan and for that reason the extension of the railroad to this point, which has been so long delayed, will be an encouragement to the coffee and sugar growers of Michoacan to increase their production with the prospect of a larger market in view, and at the same time the traffic resulting to the railroad company will make their Morelia Branch probably more profitable than any other portion of the line. The road should be in operation to Patzcuaro in three or four months.

Meherrin Valley.—This road is now completed and in operation from Margarettsville, N. C., to Hicksford, Va., on the Petersburg road, a distance of 20 miles. Two trains a day are run each way, one a passenger, the other a mixed train. The road is in excellent condition, and the passenger train is run through in 40 minutes. The line is through an excellent farming country, and there is also much timber near the road, six saw-mills being now in operation. The company expects soon to begin work on an extension from Hicksford through Clarksville to Danville.

St. Paul, Brainerd & Northwestern.—The contract for the construction of this road has been let to an organization known as the Brainerd Construction Co., and it is stated that arrangements will be made at once for building the proposed line from Brainerd, Minn., to Grand Forks, Dakota.

Shelby Iron Co.—This company has recently completed a railroad extending from Columbiana, Ala., on the East Tennessee, Virginia & Georgia road, to its furnaces at Shelby Iron Works. The road is 6 miles long and is of 5 ft. gauge.

Milwaukee, Lake Shore & Western.—The Marquette Mining Journal says: "The ore docks which the Milwaukee, Lake Shore & Western Co. is now building at Ashland will have 234 ore pockets, the floor-plates of which will be lined with steel, as also will be the chutes, this being the first time that steel has been used for the purpose. The plates which form the floors of the pockets are 36 by 120 in. and ¾ in. thick. Those used for the chutes are 39 by 70 and 39 by 58 in., and ¼ in. in thickness. The chutes are 21 ft. long. At least 400 tons of steel will be required for these purposes. The bolt and spikes used in the timber frame work of the docks will amount to over 300 tons."

Missouri Pacific.—A conference in St. Louis, March 15, between the officers of this company and the state representatives of Texas and Kansas brought about the end of the strike. Gov. Martin and the Commissioners of Kansas came from Topeka to help bring about a settlement, but they did not come until they were given positive assurance that General Manager Hoxie, of the Gould lines, was willing to discuss the question in all its details, and negotiate terms. Besides the Kansas delegation the Missouri Railroad Commissioners were in attendance at the meeting. Gov. Marmaduke was ill at his home and did not attend the meeting. Besides Messrs. Hoxie and Hayes the railroad companies were represented by the Attorney of the Missouri Pacific, and by Solon Humphreys and Thomas E. Tutt, Receivers of the Wabash Co.

As a result of the conference it was resolved to restore the rate of wages which prevailed prior to last September, and to give the men one and a half time for all extra work. This was more than they asked for, their request being that the railroad companies restore the rates which prevailed prior to the January cut. This proposition was first made by the state officials, and that it was kindly received by the railroad companies was proved later, when Mr. Hayes drew up a circular in which he embodied not only the above terms but inserted another clause to the effect that henceforth the railroad companies would notify employees of any cut 30 days in advance, so as to give them time to enter their objections, and so as to do away with another clash like the present. This latter clause Mr. Hayes inserted, not only to conciliate all parties but in deference to the Texas law requiring railroad companies to give 30 days' notice of a cut in wages.

The following is the text of the circular issued by Vice-President Hayes:

"The following suggestions have been presented to the undersigned as a solution of the difficulties at present impeding the operations of these railroads:

"Whereas, On account of the strike among certain employees of the Missouri Pacific Railway Company in the states of Missouri and Kansas, resulting in the stoppage of all freight traffic over the said company's lines in the said states, to the great detriment of the business interests and the rights of the people in the said states, and the continuance of which endangers the public peace and the safety of the company's property; and

"Whereas, The undersigned, representing the states above named, are anxious to restore harmonious relations between the said company and its employees and to restore to the public unobstructed use of the said lines, do recommend and request the said company to restore to its striking employees in Missouri and Kansas the same wages paid them in September, 1884, including one and one-half price for extra time worked, and to restore all said striking employees to their several employments without prejudice to them on account of the strike. Believing that the foregoing will constitute a just and fair settlement, we recommend their acceptance by the striking employees as well as by the Missouri Pacific Railway Company."

[Signed by John A. Martin, Governor of Kansas; John S. Marmaduke, Governor of Missouri; L. S. Turner, Almerin Gillette, James Humphrey, Railroad Commissioners of Kansas; George C. Pratt, James Harding, W. G. Downing, Railroad Commissioners of Missouri; B. G. Boone, Attorney-General of Missouri; J. C. Jamison, Adjutant-General; Oscar Kochtitzky, Commissioner of Labor Statistics.]

"With a desire to concur with the recommendations expressed above by the state officials and to open the usual avenues of commerce, and with a spirit of amity and harmony toward the employees of these companies, this is to give notice that the rates of wages and terms above specified will go into effect on Monday morning, March 16 inst., and will be in effect from and after that date. Hereafter the said rates will not be changed except after 30 days' notice thereof given in the usual way."

This circular was well received, and the strikers generally returned to work, after a little delay in order to ascertain if the company were acting in good faith. The delayed freight trains were released and traffic generally resumed.

The locomotive engineers have complained that the company has not kept its agreement with them in good faith. The matter has been laid before the Grievance Committee of the Brotherhood, and an amicable settlement will probably be reached.

New York Central & Hudson River.—The belt line local service around the city of Buffalo, which was begun two years ago as an experiment, has been very successful so far and is now considered as permanent. It is understood that it has been fairly profitable except at the first start, and the running of these trains has had the effect of increasing the value of property and building up the outskirts of the city to such an extent that it is thought that an increase in the service and the running of additional trains will be warranted by the business.

New York City & Northern.—The Receiver recently applied to the Court for authority to issue \$150,000 in certificates, but after consideration the Court denied the application.

New York, Lake Erie & Western.—The Rochester (N. Y.) *Democrat* says: "Yesterday Chief Engineer Blunden arrived in the city with plans for the new passenger station, which is to be built of brick, two stories high, with a handsome tower. The upper story will be used for office purposes, and the ground floor for passenger waiting-rooms. The dimensions of this portion of the building are to be 50 by 60 ft., while on either side will be placed additions 50 by 15 ft. each, one to be used for the storage of baggage and express matter, and the other as toilet-rooms in connection with the passenger waiting-rooms. The train-house proper is to be placed at the south end or back of the main building. On the west side storage tracks capable of supplying room for 25 passenger coaches will be constructed. Between the river and station sufficient room is reserved for the hotel omnibuses, and directly next to the river wall a limited number of public carriages will be permitted to solicit the custom of the traveling public under the supervision of the company's agent. The freight house will be 400 by 60 ft. in dimensions, constructed of brick. The north portion will be two stories in height and will contain the general freight offices and room for the storage of perishable and bonded freight. Work will be commenced as soon as the weather will permit. The station will front on Court Street on the spot where Delano's planing mill now stands. In addition to the station a large number of side tracks for freight will also be laid."

New York & New England.—The holders of the car-trust bonds are not assenting rapidly to the proposition to exchange their securities for second-mortgage bonds of the company. Out of the \$1,200,000 in car-trust certificates holders of only \$425,000 have consented to the exchange. The result of this failure to adopt this agreement will probably be an application to the Court for an order authorizing the removal of the trust cars from the road.

New York, Susquehanna & Western.—This company owns nearly all the stock of the Pennsylvania Anthracite Coal Co., which several years ago bought a large tract of coal land near Scranton, Pa. From this land is derived most of the coal tonnage which passes over the New York, Susquehanna & Western road. Recently a judgment for \$500,000 was confessed by the coal company in favor of a Scranton banking firm, and an order was made for the sale of the property by the sheriff. Some of the stockholders have now applied to the United States Court for a stay of the sale and the appointment of a receiver for the coal company. The object of the railroad company in thus confessing judgment and permitting the sale of its coal property is not very clear.

New York, West Shore & Buffalo.—The difficulty with the Union Terminal Co., in relation to the use of the passenger station in Buffalo, only continued for a day. The point at issue was satisfactorily adjusted in a short conference, and on March 12 the West Shore trains once more began running into the station.

North Carolina Charters.—At its recent session the North Carolina Legislature passed acts chartering the following companies: Cabarrus & Stanley, Cashie & Roanoke; Chesapeake, Norfolk & Carolina; Catawba County & Tennessee Line; Carthage; Caswell; Durham & Roxboro; Mt. Holly & Denver; Oxford & Clarksville; Pittsboro, Reidsville & Dan River; Roanoke & Raleigh; Roanoke & Tar River; Spartanburg & Shelby; Southern & Western Air Line; and Wilmington, Onslow & East Carolina.

Acts were passed amending or extending the following charters: Albemarle & Roanoke (name changed to Roanoke Railroad Co.); Atlantic & Western; Clinton; Goldsboro, Snow Hill & Greenville; Murfreesboro; Roxboro; Upper Yadkin.

Acts were passed assigning convicts to work on the following roads: Albemarle & Raleigh; Carolina Central; Louisville; Midland North Carolina; Oxford & Clarksville; Raleigh & Augusta Air Line.

Acts were also passed authorizing the city of Wilmington to subscribe to the stock of the Cape Fear & Yadkin Valley; authorizing the Raleigh & Augusta Air Line to extend its road and build branches; in relation to the bonds of the Western North Carolina, and to provide for the extension of that road to Murphy.

Northern (New Hampshire).—A charge having been made by some of the stockholders, who are suing for a division of the assets of this company, that when the Sullivan County road was sold to the Vermont Valley Co. a less amount was credited on the books of the Northern Railroad than had actually been paid for the road, the directors have produced a transcript from the records of the company, showing that the road was sold for \$700,000 and that the full amount appears on the books. The records of the Vermont Valley Co. will also be published to substantiate this statement.

North Shore.—A report was circulated last week that the Canadian government had bought this road, which extends from Montreal to Quebec on the north side of the St. Lawrence River. There have been some negotiations, but it is said that Mr. Senecal and associates, who bought the road from the Quebec government, now ask a higher price than the Dominion government is willing to pay.

Ohio Central.—The bondholders of the River Division met in New York, March 16, and appointed a committee to prepare a plan of reorganization and to report to a future meeting. Nearly \$1,000,000 in bonds were represented at the meeting. The committee consists of G. Hilton Scribner, Erwin Davis, James T. Glosson, George M. Bartholomew, John H. Beach and Edward C. Homans.

This committee has adopted a plan which provides for the sale of the River Division under the foreclosure proceedings now pending, its purchase by the bondholders and the organization of a new company which shall issue bonds at the rate of \$10,000 per mile to complete and equip the road; first-preferred stock for the present first-mortgage bonds; second-preferred stock for the present incomes, and common stock for the present stock.

Philadelphia & Reading.—The Philadelphia *Ledger* of March 18, says: "The Reading Railroad's financial situation is again causing some anxiety, it being quite evident that all its payments due at the beginning of April cannot be met from the company's income. The receivers are consequently expected to fail to meet all payments then due on account of the New Jersey Central Railroad, and this apprehension,

which will soon ripen into a reality, has caused weakness in that stock. It is confidently anticipated that the New Jersey Central Railroad consolidated mortgage quarterly interest due April 1, amounting to \$262,000, will not be met, and there is also a further payment due at that time on the New Jersey Central car trusts for principal and interest. We understand that, in anticipation of this, preparations are being made to again put New Jersey Central into the hands of a receiver, and, this being done, the consolidated mortgage interest may be advanced by somebody on purchase of coupons. With this matter out of the way the Reading Receivers will probably be able to meet their other payments due April 1, and previously. The United States Court has just ordered the payments on account of the Reading Car Trust, due March 15, principal and interest amounting to about \$145,000. This the Receivers have funds in hand to pay. The interest on the second-mortgage 7s, amounting to \$94,500, and on the improvement mortgage 6s, \$281,000, matures April 1, and we understand it is the Receivers' intention to pay both, and for this purpose they will husband their resources. Early in April there will be also due \$182,000 for taxes to the state of New Jersey by the Reading Co., and just what policy will be pursued about this payment has not yet transpired. The Reading income is rather better now than it was a few weeks ago, the coal trade having somewhat improved, and they have reduced by payments the balance now due for the advance on the general mortgage interest made last July to about \$65,000. Nothing has yet been done, however, to reimburse the consolidated mortgage interest advanced last December. The Reading floating debt as it falls due is arranged at present with all creditors, generally upon four months' notes, they paying the discount in cash. Very little stock is taken by anybody in the proposal for an extension of this debt for a term of years. The lenders will not change their present plan of dealing with it, and the new project meets with general disapproval, for banks and trust companies, who are the chief creditors, do not desire to tie up their assets in the manner suggested."

Pittsburgh, Fort Wayne & Chicago.—This company has given notice to the New York Stock Exchange of its intention to issue \$1,110,000 additional special guaranteed stock, in payment for betterments made by the lessee.

Pullman's Palace Car Co.—The Philadelphia *Ledger* says: "The Central Transportation Co., which has heretofore been leased by the Pullman Palace Car Co. at a rental of 12 per cent., has had to modify its lease. By the new agreement the Pullman Co. is to pay a rental of \$66,000 annually (with 25 per cent. of the taxes to be paid), which is equal to 3 per cent. annually on the Central Transportation Co.'s capital of \$2,200,000. The new agreement gives the Central stockholders the option of exchanging four of their shares for one of the Pullman Co. This proposition is to be submitted to a vote of the Central stockholders, at a meeting to be held March 18. The par of Central stock is 50 and the market quotation 29@30. We are informed that the Central Co. has \$650,000 invested funds (besides its cars), which, if divided among the shareholders, would be equal to \$15 per share. The approval of the agreement and exchange of stock will carry all the assets of the Central Co. to the Pullman Co."

Securities on the New York Stock Exchange.—The Governing Committee of the New York Stock Exchange has placed the following securities on the lists:

Chicago & Eastern Illinois. \$2,500,000 first consolidated 6 per cent. bonds. The total issue authorized is \$6,000,000, but \$3,500,000 remain in the hands of the trustee to be exchanged for outstanding bonds of previous issues.

Oregon & Transcontinental. \$1,553,000 new first-mortgage 6 per cent. bonds, issued on new branch lines. This makes the total amount of these bonds listed \$9,553,000.

St. Lawrence, Temiscouata & Edmundston.—This company has begun work on a line which is to run from Riviere du Loup, Quebec, on the St. Lawrence River and the Intercolonial road, by way of Lake Temiscouata and the Madawaska settlements to Edmundston, the present northern terminus of the New Brunswick Railroad. The line is through a forest country which is said to be very fertile, but is for the greater part without inhabitants.

St. Louis Coal Railroad.—In the United States Circuit Court in Chicago, March 14, Judge Gresham disposed of the motion of the Wabash, Chester & Western Railroad Co. to forfeit the lease of that road to the St. Louis Coal Road Railroad Co. He permitted the Wabash, Chester & Western to take its property out of the hands of R. J. Cavett, the Receiver, and to operate it for the time being until further orders from the Court, but ordered that it shall remain a party to the controversy and subject to all the equities which may be established against it and its property on behalf of any party interested in the suit.

In the matter of the Carbondale & Shawneetown Railroad Co., a leased road, which had never been placed in the hands of the Receiver on account of a claim of forfeiture of the lease before the commencement of this suit, all the parties appeared, and an order was made by consent setting aside the forfeiture of the lease, placing the road in the hands of the Receiver with directions that he keep a separate account of the earnings of the road, pay out of them all charges due the lessor, past and future, and that any surplus income is to be administered with the common fund. The litigation is pending in the Southern District of Illinois at Springfield, and comes before Judge Gresham as United States Circuit Judge.

Sylvania & Rocky Ford.—This road is now in operation from Rocky Ford, Ga., on the Central Railroad, northeast to Sylvania, the county seat of Screven County. It is 18 miles long and is operated as a branch of the Central road.

Texas & Pacific.—Just before his retirement from office, Secretary of the Interior Teller ordered the issue to the assignee of this company of patents for what has been known as the "Backbone land grant," in Louisiana. The grant was claimed by this company under an assignment made by the New Orleans, Baton Rouge & Vicksburg Co. to the New Orleans Pacific Co., and amounted to about 1,000,000 acres. Patents were issued for 679,287 acres, when any further issue was suspended by order of the new Secretary, Mr. Lamar. The matter has called out a very sharp discussion in the Senate, where it was claimed that the original grant had been forfeited by failure of the grantee to comply with the conditions, and that the New Orleans, Baton Rouge & Vicksburg Co. had no right to assign it to the New Orleans Pacific, and further, had no legal existence at the time the transfer was made.

Tyler & Bastrop.—Arrangements are being made to begin work on this road, which is to extend from Tyler, Tex., southward to Bastrop, a distance of about 40 miles.

Union, of Chattanooga.—This road has now been completed, the last rail having been laid March 14. The road is 9 miles long, with numerous spurs and sidings, and forms a belt line around the city of Chattanooga, Tenn., connecting with all the railroad lines and also running for nearly three miles along the Tennessee River, where transfers to and from

boats can be made. It connects with all the large manufacturing establishments, and also makes valuable several large tracts of property which have not hitherto been used for building because they were too remote from the railroads to make them available for mill sites. About five miles of the road were built last year.

Union Pacific.—This company's statement for January gives the following figures:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings	\$1,674,949	\$1,531,694	I. \$143,255	9.4
Expenses	1,188,557	1,376,503	D. 187,946	13.6
Net earnings	\$486,392	\$155,191	I. \$331,201	213.4
Per cent. of expenses.	71.0	89.9	D. 18.9	.....

Taxes are included in the expenses in both years.

This company's land sales for February were 46,235 acres for \$119,299. For the two months ending Feb. 28, the sales of the Union Division were 55,829 acres, and on the Kansas Division 31,122, a total of 86,951 acres for \$214,880. In the corresponding period of 1884 the total sales were 286,108 acres for \$806,287.

Utah Eastern.—The Receiver of this road has been making an inspection of the property, and reports that it is generally in better condition than might be expected for a road which had not been operated for several years. There are 23 miles of main track from Park City to Coalville, and 4 miles of a branch. There have been a few wash-outs, and three small bridges are gone. Two locomotives and a number of cars remain on the track; one locomotive and 23 cars had been taken to the Utah Northern road, but the Receiver has the numbers of these and is assured that they will be returned. He has as yet made no arrangements for repairing the road or putting it in operation.

Vancouver & Yakima.—This company has filed articles of incorporation to build a railroad from Vancouver, Washington Territory, in a northeasterly direction across the Cascade Mountains into the Yakima Valley, with branches wherever necessary. The principal office is in Vancouver.

Wabash, St. Louis & Pacific.—A dispatch from London, March 12, says that at a meeting of the English bondholders on that day it was resolved to reject the plan of reorganization proposed by the company. It was also resolved to have an investigation of the company's affairs, and to take steps for the removal of the present management. The management was bitterly denounced by a number of those present at the meeting.

The holders of Toledo, Peoria & Western bonds have appointed as a committee to enforce the terms of the mortgage the following gentlemen: Charles Moran, Thomas Denny, Cornelius B. Gold, De Comyn Moran, William H. Secor, O. H. Shepard, and William H. Gebhard. The committee is invested with authority to ask for the removal and appointment of trustees. It is also empowered to purchase the property at such price as it may deem judicious.

The committee representing the bondholders has issued a circular to holders of Wabash, St. Louis & Pacific Havana Division bonds, stating that they took all necessary legal steps preliminary to a foreclosure suit, but stopped these proceedings under assurances from the Receivers to the effect that they desired to retain this division as part of the Wabash system, and that they would obtain an order from the Court authorizing the payment of overdue coupons. The Receivers applied for such an order, but the Court refused it on the ground that the account did not show that this line was earning the interest. The committee have therefore instructed their counsel to continue the suit and hope to have a hearing early next month. The committee calls on bondholders to pay up their subscription of \$5 per bond for the purpose of meeting the necessary legal expenses.

For the three months ending Dec. 31 last the total earnings of this division were \$63,719; the expenses, including car-trust charges and taxes, were \$69,346, leaving a surplus of \$373. The deficit from May 29 to Sept. 30 was \$21,206, making a net deficit of \$20,933 from the appointment of the Receivers to Dec. 31, seven months.

The Receivers, having awaited to some extent the result of the strike on the Missouri Pacific, when that company gave way and agreed to restore the wages as desired by the strikers, concluded that it was best to take the same action, and accordingly offered to make an agreement, providing that all shall return to work at the rate of wages prevailing before the last reduction was ordered. This agreement was generally accepted, work to be resumed in all the shops March 19.

Western Counties.—A proposition has been made to the Nova Scotia government by a syndicate, which offers to take this road, now completed from Yarmouth, N. S., to Digby, and complete it by building 20 miles of road from Digby to Annapolis. This syndicate also proposes to lease the Windsor & Annapolis Road, and operate a through line from Halifax to Yarmouth, running in connection with the road a line of fast steamboats between Yarmouth and Mount Desert Ferry, thus making, in connection with the Maine Central, a new line between Portland and Halifax. The syndicate offers to provide all the money necessary to put the Western Counties road into good condition and complete it, on condition that the Nova Scotia government will guarantee the interest on \$1,000,000 in bonds. The syndicate includes a number of gentlemen who are largely interested in the Maine Central road, and is represented by Mr. F. H. Clergue.

Wilmington & Weldon.—This company has offered to build a branch line from Garysburg, N. C., east by south to Salmon Creek, about 45 miles, provided Northampton and Bertie Counties will subscribe \$140,000, which is about one-quarter of the estimated cost of construction. The projected line, which has been talked of for a number of years, passes through some of the finest country in Eastern North Carolina, which is especially adapted to the cultivation of fruits and early vegetables.

Wisconsin Central.—This company has bought the charter of the St. Paul, Four Lakes & White Bear Co., which was organized about a year ago to build a railroad from St. Paul to White Bear. The Wisconsin Central line now enters St. Paul on the St. Paul & Duluth track, and the purchase of this charter is supposed to indicate an intention of carrying the road into St. Paul on its own track at some future time, if not at present.

Xenia & Southern.—It is proposed to build a railroad from Xenia, O., southward to Blanchester on the Cincinnati, Washington & Baltimore, a distance of 30 miles.

Youngstown & Southwestern.—There is talk of building a railroad from Youngstown, O., southwest to Oneida, about 40 miles, the object being to secure a connection with the coal mines on the Connoton Valley road.

Zanesville & Coshocton.—It is proposed to build a railroad from Zanesville, O., northward about 25 miles to Coshocton, to connect with the Connoton Valley road. The present plan is to organize a new company to do the work, as it does not appear probable that the Connoton Valley Co. will be able to extend its line south of Coshocton for some time to come.